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OVERSEAS RAILWAYS

SPECIAL NUMBER OF THE RAILWAY GAZETTE

On November 28 will be issued a Special Number of "The Railway Gazette" devoted entirely to recent progress made by, and current problems affecting, various railways in the Dominions, Colonies, and other countries such as Argentina and Brazil where British-owned railways operate. This number is additional to the ordinary weekly issue and will be sent to all regular subscribers. Extra copies, price 1s., *may be obtained through any newsagent, or direct from the Publisher, post free,* 1s. 3d.

The London Traffic Pool

EVER since the London Passenger Transport Board came into being, a committee has been conferring with representatives of the main line railways as to the precise terms of division of the pool of passenger receipts in the London area which the L.P.T. Act of 1933 directed to be established. As long ago as February last Mr. Frank Pick stated in a lecture at the London School of Economics that the board would contribute about 72 per cent. and the main line railways about 28 per cent. of the gross receipts of the pool. The rough figures of division of the pool then contemplated were 66⅔ per cent to London Transport and 33⅓ per cent. to the main line railways. The pool is retrospective to July 1, 1933, when the L.P.T. Board began operating, but the wealth of detail to be considered has so far prevented final figures being agreed, and this was an important reason for the issue of only an interim financial statement of London Transport results for its first year. We now learn officially that the final stages have been reached and that a statement of the precise sharing proportions may be anticipated within the next two or three weeks. At one time it was feared that it would be necessary to appeal to the London Transport Arbitration Tribunal to fix the terms, but mutual concessions appear to have been successful in avoiding the resultant delay and expense.

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Railways in 19—

It is refreshing to close the eyes sometimes in the dark period of depression and let the mind dwell on images of a brighter future. A correspondent who did this recently has sent us the result and gladly we publish it on page 864. It is a pleasing picture from which every sordid detail has been eliminated. There is no rush and tumble, no creaking taxi held up by traffic blocks till hope of catching the train becomes dim, no comfortless night journey with nodding heads falling awkwardly on neighbouring shoulders. On the contrary, time does not press, and, thanks to wide and well planned streets, the modern public vehicle which conveys us to the station suffers no delays. The ancient taxi has long since gone to its honourable rest, and trains are so frequent that it would matter little even if the traveller missed his. The trains themselves are of one class only—the best—with sleeping berths for everyone at night. The restaurant service provides excellent, cheap meals with a wide variety of food and drink to choose from. Everything is clean, everyone is pursuing the task he likes best. A pretty picture but unlikely to be realised? Why? The *physical* means to its achievement are at hand to-day. Only a financial system more out of date than an ox-wagon in Piccadilly blocks the way.

* * * *

The Week's Traffics

The best showing in the traffic returns of the four group companies for the past week is made by the London Midland & Scottish with an increase of £32,000 which is on top of an increase of £25,000 in the corresponding week of 1933. Though the L.N.E.R. traffic advance for the past week is only £7,000, its 46th week in 1933 showed a gain of £56,000, of which £39,000 was in merchandise. Great Western merchandise traffics for the corresponding week in 1933 had an increase of £19,000, and there was a total advance of £23,000 for that week. The Southern passenger train increase for the past week follows a small increase in the 46th week of 1933. For the 46 weeks of the current year the four companies together record traffics of £132,009,000, an increase of £5,098,000 or 4·02 per cent.

	46th Week				Inc. or dec.	
	Pass. &c.	Goods, &c.	Coal, &c.	Total.	Year to date	
	£	£	£	£	£	%
L.M.S.R. ..	+ 15,000	+ 6,000	+ 11,000	+ 32,000	+ 2,104,000	+ 4·14
L.N.E.R. ..	+ 1,000	+ 1,000	+ 5,000	+ 7,000	+ 2,010,000	+ 5 42
G.W.R. ..	—	+ 2,000	— 2,000	—	+ 585,000	+ 2·71
S.R.	+ 6,000	— 1,000	— 1,000	+ 4,000	+ 399,000	+ 2·29

London Transport receipts for the past week are up £18,600, bringing the advance for the 20 weeks to £143,600. The Mersey has an improvement of £157 for the past week. Both the Great Northern (Ireland) and the Great Southern show increases in passenger and goods train receipts for the week.

Six Months' Merchandise Traffics

The increases in higher class merchandise traffics of standard gauge railways for the first six months of 1934, as shown by the analysis given in the Ministry of Transport statistics for July last, though appreciable, were not on so high a scale as those for the first three months of the year. This may readily be understood, seeing that the traffics for the first quarter of 1934 contrasted with those for an exceptionally bad period in 1933, whereas in the second quarter of 1933 some improvement had set in. For the 28 weeks ended July 14, 1934, 25,118,185 tons of higher class merchandise were carried, an increase of 2,252,669 tons or 9·85 per cent. in comparison with the corresponding period of 1933, and the receipts therefrom were £20,956,356, an improvement of £1,260,624 or 6·40 per cent. The corresponding figures for the first 12 weeks of 1934 were 10,977,491 tons, showing an increase of 1,249,877 tons or 12·85 per cent., with receipts of £9,122,409, which meant an advance of £824,506 or 9·94 per cent. Hence it would appear that for the 16 weeks ended July 14, 1934, the quantity of higher class merchandise conveyed was 14,140,694 tons, an increase of 1,002,792 tons or 7·63 per cent., producing receipts of £11,833,947, which were higher by £436,118 or 3·83 per cent. than those for the corresponding period of 1933.

* * * *

L.M.S. Rolling Stock Workings

Railway operation is peculiar among the sciences in that it must be constantly regulated by the most commonplace exigencies of everyday life. While other products can emerge from the laboratory in a semi-finished state, and have the rough edges knocked off them gradually by contact with the world, every scheme of the railway officer must be launched fully prepared to withstand the most extreme demands likely to be made upon it by the vagaries of the travelling public. The degree of forethought and the intricate dovetailing involved in planning rolling stock workings are apparent from our article on page 848 this week, but the merit of the L.M.S.R. system there described lies as much in its economic aspects as in its capacity to cope with the widely varying traffic densities experienced in the course even of a single day. To extract the maximum service from given equipment has become more vital as a guiding principle of railway working than ever before. The planning of daily duties for some 18,000 vehicles, distributed over 6,942 route miles, in such a manner as to provide for all contingencies, is further complicated by the fact that it is not merely a matter of serving stations with coaches, but of seeing that the stock supplied is of a suitable type for the traffic involved. In this, the operating department shares the responsibility of attracting and holding patrons of the railway.

* * * *

Increased Expenditure by American Railways

There is evidence of increased expenditure on fuel, materials, and supplies by the Class I American railways in an estimate made by the *Railway Age*. Taking the first seven months of this year as a whole, the outlay in these directions exceeded the corresponding 1933 figures by $144,400,000, or sixty-three per cent. There was also an advance of thirty-seven per cent. over the expenditure for the same period of 1932. The present total, estimated at $372,000,000, excludes purchases of new locomotives and rolling stock, and materials bought by railway contractors. The bill for fuel rose by $32,828,000 and the June purchases of all materials included in the estimate were the highest in any month since June, 1931. July, however, saw a sharp recession in all classes except fuel, the figures falling by approximately $8,000,000 from the June record. This in part reflects the decreased activity and the fall in receipts, but is contributed to by the fact that the figures are based not upon the value of orders placed in the respective months but of goods received. The retrenchment which had actually started in June did not therefore become apparent until July. Additionally, most of the purchases made with the Public Works Administration Loans have now been completed. It is pointed out, too, that the higher prices ruling under the N.R.A. code suggest the acquisition of more material than was actually the case.

* * * *

Paris-Brussels Express Service

Since the inauguration of the Continental winter timetables at the beginning of October last, some further accelerations of the express service operating between Paris and Brussels have become effective. All previous records have been broken by the new timing of the southbound Blue Bird Pullman express, which covers the 193·1 miles between the two capitals in 183 min., at an average of 63·3 m.p.h. from start to stop. The northbound North Star Pullman now takes 189 min. from Paris to Brussels, and the northbound Blue Bird 190 min., while the southbound North Star requires 194 min.; three of the four non-stop trains thus operate over the route at an average rate of over a mile-a-minute, and the fourth at only a fraction below that figure. On the French side of the frontier certain other of the expresses have some very fast timings, such as 88 min. by two trains over the 95·1 miles from Paris to St. Quentin, entailing a start-to-stop speed of 64·8 m.p.h. But the latest accelerations are largely due to the extensive track improvements which have been carried out in Belgium, permitting higher speeds. As is well known, engines of the Northern Railway of France work these services throughout between Paris and Brussels, and the rebuilt Pacifics recently acquired from the Paris-Orleans Company are now being used. The Paris-Brussels service, on which ten trains, five in each direction, now operate at an inclusive average speed of 58·4 m.p.h., is the fastest inter-capital railway service in the world.

* * * *

Standardisation on the Swedish Railways

That a certain scope exists for the introduction of standardisation into railway engineering work is now generally admitted and in some countries a good deal of progress in this direction has been made. The Swedish State Railways have been later than some in entering on the task, but this is explained by the fear that a premature standardisation might be found to bring disadvantages later on and the desire to be quite certain of its suitability in every case before applying it. In Swedish industrial circles, of course, a number of standard designs and specifications had been instituted, the mechanical and electrical engineering and metallurgical firms, in association with the Government, having established a Standards Institution in 1922. The adoption of most of these standards by the railways was found to accelerate work in the shops and proportionately reduce its cost. In 1932 the management decided to appoint a committee to consider the standardisation of rolling stock designs, a field appearing to offer considerable opportunity for effecting economies by this means. A series of drawings and specifications was accordingly prepared. One result has been to reduce the number of types of axlebox liner from 100 to 13. Standard open and closed type goods wagons are to be adopted for new work. The former have been designed and 150 wagons obtained. The details for the closed type, which will be suitable for running in fast trains, have not been settled as yet. A beginning has

thus been made and in due course many other items will come under the committee's consideration. Eventually, it is hoped, large sums will be saved by this policy.

* * * *

Light Metals in Rolling Stock construction

An interesting review of the use of light metals in the construction of rolling stock is contained in a paper by Messrs. R. Zehnder and Ad-M. Hug submitted to the 24th Congress of the International Union of Tramways, Light Railways, and Public Motor Omnibuses in Berlin last July. Figures are given of the comparative weights of vehicles constructed on the old-fashioned orthodox lines and similar vehicles incorporating the latest refinements, including the replacement of heavy unstressed parts by parts made of aluminium alloys. Many of the examples cited have already been described in these pages but the number of applications is being so rapidly multiplied that Messrs. Zehnder & Hug's paper is worth study. Such figures as the replacement of 6 tons of iron parts by half that weight of light alloys in suburban coaches forming trains of eight and ten vehicles is significant. The double-deck suburban cars of the French State Railways contain 5 tons of light metal in parts which would have required 13½ tons of steel otherwise. And so the tale goes on, with the prospect of total reductions in the weight of future rolling stock by as much as 30 and more per cent. when all the various refinements of modern construction are incorporated.

* * * *

Steel Sleepers

Several letters have appeared in *The Times* recently on the subject of steel sleepers, two of which we reproduced in THE RAILWAY GAZETTE of September 7 on page 380. Another letter was published in *The Times* of November 9 over the signature of Herr R. Vogel of the Society for Research of Permanent Way in Berlin. Herr Vogel began by mentioning that at the moment about one-third of the German State Railway permanent way is laid with steel sleepers, a practice which has persisted for 50 years. In the earlier days the best results were not attained owing to faulty design but improvements, particularly with regard to the thickness of the section and the type of fastening, have enabled steel sleepers to equal the service given by wooden sleepers ; difficulties with regard to ballasting have been overcome. Herr Vogel recommends the addition of a small quantity of copper to the steel from which the sleepers are manufactured as a deterrent to corrosion. The subject is of special interest at present in view of the recommendation by the Granet Commission (of which one member was Herr Meyer of the Reichsbahn) that an improved design of steel sleeper should be used on the South African Railways, the design suggested being based on the latest German practice of which we give details in an article on page 854, together with comparative details of the existing South African standards.

* * * *

Track and Train

Although railways came into existence over a century ago, the scientific study of the movement of vehicles on the track and the forces at work between wheel and rail was for some time neglected, and has only in comparatively recent years received some of the attention it deserves. The complexity of the problem and the great difficulty of measuring accurately the forces involved in any particular case have accounted for this in the past. Of late, however, many keen minds have been attracted to the subject and have produced mathematical analyses of the problem. From time to time derailments have occurred for which no satisfactory explanation has been forthcoming. This has led the German State Railway to appoint a commission to investigate the behaviour of vehicles on a track containing artificial deformations. Some experiments have been made with the aid of very ingenious measuring instruments adapted for mounting on bogies and axleboxes, designed by the Heinrich Hertz Institute, and recording the forces acting throughout the run. In this way the approach to dangerous limits can be detected. Even if these measurements only confirm theories already advanced and reveal no new facts, they will have served a most useful purpose, but whether any derailments will be explained thereby remains to be seen.

* * * *

Railway Machine Shop Problems

The machine shop of a railway works can be said to bristle with problems, the solution of which often brings other problems in its train. The same is, of course, true of other sections as well, the erecting and boiler shops, the foundry, and, indeed, all parts of the establishment. The machine shop is, however, identified more closely than any other with that multiplicity of operations which, as a matter of course, present the greatest number of problems and consequently opportunities to develop ideas and effect time and labour saving improvements. Here, it is a method of handling a particular component during machining or other treatment, and there, one of transporting material and parts from one place to another. Lifting heavy items from the bench to the machine and *vice versa*, or taking them in and out of a vice and passing them along laboriously by hand, all mean unremunerative time, much of which can be saved and turned to more profitable account by the introduction of simple and easily controlled devices. Much has been achieved in this direction, and in a railway shop which we recently visited we found that by such methods, coupled with more intensive use of the machine tools, economies of the most important kind are being effected. Intershop communication by means of power trucks has similarly revolutionised transportation in railway and other engineering establishments during recent years.

* * * *

Railway Workshop Organisation

We have frequently drawn attention to the high degree of perfection nowadays reached in the organisation of railway shops, particularly in the systems adopted for expediting the repair of locomotives and rolling stock. During the discussion on Mr. H. G. Beckwith's paper on " Railway Workshops Organisation," read at a meeting of the South American centre of the Institution of Locomotive Engineers, modern methods were compared with those of earlier date. In the past there was a general lack of system or organisation on many railways. The old fashioned system, or rather lack of it, was that when a locomotive was run down it was shopped for repairs. Frequently, no preparation had been made to " programme " the repairs to be carried out, and the extent of the work required was, as a rule, not known until after the engine had entered the shops, with the result that the time of withdrawal was greatly extended. A similar state of affairs existed in the shopping of coaching and wagon stock. The coach and wagon inspector, on finding that a vehicle was getting rather shabby, would arrange for it to be sent for repair, practically regardless of the capacity or output of the shops, so that it was not uncommon to see long lines of vehicles kept in sidings awaiting attention. The result of this lack of system was that a high percentage of rolling stock remained idle for long periods, incurring the locking up of the large amount of capital value represented therein.

Queensland Government Railways

A FURTHER improvement in the results of the Queensland Government Railways is shown in the report for the year ended June 30, 1934, which we have received from Mr. J. W. Davidson, Commissioner for Railways. It is particularly satisfactory to note that for the first time since 1928-29, the gross earnings show an increase over those of the previous year which amounts to £233,230 or 3·96 per cent. Expenditure, although showing an increase of £159,547 or 3·75 per cent. on that of the previous year, has been kept well in hand. To the extent of about £94,000 expenditure was swollen by the introduction of the 44-hour week. Net earnings were the largest in the history of the railways and represented a return of £4 15s. 1½d. per cent. on capital (opened lines), also a record, the next best returns having been 4·590 per cent. in 1932-33 and 4·508 per cent. in 1910-11. It must be remembered, however, that the capital was reduced by £28,000,000 under the provisions of the Railway (Capital Indebtedness) Reduction Act, 1931. Though there was an increase of £346,388 in capital during the year 1933-34, the charge for interest was £28,780 lower than for the previous year, owing to the reduction of the interest rate from 4·37 per cent. to 4·25. In consequence, the net surplus after payment of interest increased from £57,654 to £160,118. Operating figures are compared in the accompanying table:—

	1933–34	1932–33
Miles open	6,497	6,497
Passenger journeys	22,806,056	22,146,783
Goods and minerals, tons	3,834,787	3,308,332
Paying goods, ton-miles	541,237,599	517,502,024
Average haul, miles	134·56	147·72
Train-miles	11,043,957	10.730,536
Operating ratio, per cent.	71·96	72·10
	£	£
Passenger revenue	1,375,542	1,301,405
Goods and minerals, receipts	3,568,297	3,463,532
Total earnings	6,118,898	5,885,668
Working expenses	4,403,370	4,243,823
Net earnings	1,715,528	1,641,845

Country passengers increased by 165,148 and brought in £71,822 more revenue, and the improvement in suburban travel represented 494,125 in numbers and £2,315. Weekly season tickets introduced in November, 1931, have been increasingly popular. The improvement in goods traffic was due largely to the fact that the figures for the preceding year had been considerably decreased owing to a reduced sugar-cane harvest, whereas during the year under review the crop throughout the State was a record one. General merchandise and timber also gave satisfactory increases, but the revenue from wool and minerals declined, partly owing to reduced rate scales. Live stock brought in an increase of £31,866, the first increase since 1927-28. Liberal freight concessions have been granted, and in addition many special rates have been quoted in order to secure business which otherwise might have gone by other means of transport. There was a marked improvement in the earnings of branch lines which, as a whole, paid working expenses and contributed 3s. 2d. per cent. towards interest charges. Out of a total of 65 branches, however, only seven paid working expenses and full interest charges.

Rail motor services have been well patronised throughout the year, and the rail motor mileage represented 14 per cent. of the total train mileage. The cars now in service are of the petrol engine type, but a diesel engine of 130 h.p. has now been purchased as an experiment. Train control installations were carried out during the year on the following sections: Rockhampton-Mackay, Ascot-Whinstanes, Yeerongpilly-Rocklea, and Ipswich-Wulkuraka. A further appreciable improvement has been effected in locomotive coal consumption. Three new up-to-date passenger trains for the Sunshine Route are under construction at the Ipswich shops, and the first of these is expected to be placed in traffic in March, 1935. Five 100 h.p. A.E.C. rail motor cars and eight 38-passenger rail motor trailers were constructed during the year, and work on an additional five cars and twelve trailers is progressing. Good progress is being made with bridge strengthening on the Nanango branch and between Cairns and Babinda, and work on the improvement of gradients on the North Coast line between Gympie and Mungar Junction, and between Pentland and Torren's Creek on the Great Northern Railway is proceeding. There has again been a substantial increase in the business transacted by the Tourist Bureau.

* * * *

Railway Position in the U.S.A.

OUR announcement on October 19 of the formation of the Association of American Railroads comes as a further reminder of the serious plight to which the railways of the United States have been reduced as a result of industrial depression and unregulated competition. In the autumn of 1932 a National Transportation Committee was formed to investigate the railway position and on June 16, 1933, President Roosevelt announced the appointment of a Federal Co-ordinator of Transportation, acting under the Emergency Railroad Transportation Act, 1933. The latest development is the consolidation of the American Railway Association and the Association of Railway Executives into one national railroad organisation to be known as the Association of American Railroads. In 1933 the Class I railways of the United States returned a net railway operating income of $474,369,438 which represented a return of 1·80 per cent. on their property investment, *i.e.*, the value of road and equipment as shown by the books of the railways, including materials, supplies and cash. This compared with previous years as under:—

	Net railway operating income $	Return on property investment Per cent.
1928	1,172,864,100	4·65
1929	1,251,697,938	4·84
1930	868,878,773	3·30
1931	525,627,852	2·00
1932	326,317,936	1·24
1933	474,369,438	1·80

The upward tendency which began during 1933 continued during the early part of this year but there has been a marked decline in recent months. For the first four months of the year, net operating income amounted to $144,514,673, an increase of no less than $90,638,902, or 168 per cent. compared with the corresponding period of 1933. In the succeeding four months, however, net income was $156,229,507, a decrease of $70,799,002, or 31 per cent. compared with 1933. This decrease in net revenue is accounted for by the fact that in May and June operating expenditure increased in greater ratio than gross operating revenues, while in July and August gross receipts actually decreased compared with the corresponding months of 1933, whereas operating expenses increased. The net result of this sudden setback to returning prosperity may be seen from the fact that whereas the return on property investment for the first four months of the year was 2·14 per cent., compared with 0·79 for the corresponding period of 1933, the return for the first eight months was 1·88 compared with 1·80 last year, a diminishing difference which is in striking contrast to the hopeful outlook a few months ago. The downward trend of gross revenues is ascribed to an unexpected fall in seasonal

traffics. On the other hand, operating expenditure has been considerably increased by the restoration of wage cuts by instalments as from July 1.

Since January, 1932, American railwaymen's wages had been subjected to a deduction of 10 per cent. In April last it was agreed by the Conference Committee of Managers and the Railway Labour Executives Association that 2½ per cent. should be restored as from July 1, 1934, a further 2½ per cent. as from January 1, 1935, and the remainder as from April 1, 1935. It has been estimated that this restoration of pay will increase operating costs by approximately $156,000,000 a year. Payments under the Railroad Retirement Act providing for a national system of pensions for retired railway servants, were estimated to cost $66,000,000, while the increased cost of materials due to the operation of the National Recovery Programme is appraised at $137,000,000 per annum. These three items total $359,000,000 annually. In view of the fact that at the present time 40,000 miles of American railway are in the hands of receivers or trustees in bankruptcy, a larger mileage than at any previous time in history, and that no fewer than thirty-three Class I railways failed to earn expenses and taxes in the first eight months of 1934, the outcome of these added burdens may be imagined. Incidentally, the validity of the Railroad Retirement Act was contested by the railways and on October 24 was held by the Supreme Court of the District of Columbia to be unconstitutional.

On August 27 the railways filed an application with the Interstate Commerce Commission seeking a moderate increase in freight rates. If approved, it is estimated that the proposed increase would add approximately $170,000,000 per annum to the railway revenue, or a little less than 60 per cent. of the increased costs in respect of materials and labour. From the foregoing, it will be seen that the members of the Association of American Railroads will have plenty to occupy their minds. The role of the new organisation is to act in the capacity of a general staff for the railways as a whole, the aim being to co-ordinate policy and action and to make a concerted effort to protect and advance the railway industry under private ownership and management. The step taken appears to be a logical development of the policy of co-ordination and centralisation which has become an outstanding feature of industrial practice during recent years.

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The Use of Railcars in France

ON a recent visit to France we had the opportunity of making a number of journeys in railcars, of which there are now large numbers in operation, and nearly all of which we have already described in these pages or those of our *Diesel Railway Traction Supplement*. In the early days a good deal of doubt was expressed as to the practicability of this type of vehicle, but from our own observation it would seem as if they were fulfilling their purpose. We include here in the term railcar, both single self-propelled vehicles and those with special trailers, whether coupled by articulation or otherwise. The most novel use to which railcars are put is in supplementing ordinary main line trains on high-speed schedules, or replacing those very lightly loaded, the longest regular run being between Paris and Lyons, 317 miles booked in 4 hr. 50 min., inclusive of two stops. Other examples are the Paris-Lille-Tourcoing service, 168½ miles in 3 hr. 3 min. including five stops, Paris-Caen, 148½ miles in 2 hr. 30 min., with two stops, Paris-Le Havre, 142 miles in 2 hr. 10 min., with a stop at Rouen. These services appear to be so well patronised that those who do not book their seats beforehand are liable to be left behind, and it is rare that there are more than a very few vacant seats. They have made possible round trips between Paris and the provinces, allowing several hours for business, and return home the same night. As bearing on this matter we would quote Mr. A. Cotsworth, Junior, Passenger Traffic Manager of the Chicago, Burlington & Quincy Railroad, who recently stated that the purpose of his company in building the Burlington Zephyr, and adding to the number of such units, was to effect economy in operation. About 27 per cent. of the passenger train mileage on that system consisted of 3 to 5-car trains which could be supplanted by these light fast units. On the basis of 500 miles a day the total cost of operating the Zephyr worked out at about 50 cents a mile including capital charges. The Zephyr will further effect considerable economy in time and will operate between Kansas City and Lincoln on a 4-hour schedule, including nine intermediate stops, replacing two 5½-hour trains. Light fast railcars are also used for the conveyance of newspapers from Paris in the early hours to provincial centres, and the same cars on their return trip are available for carrying passengers.

Similar supplementary services have been instituted on cross-country routes, and to give fast connections with main line trains on branches and lines with meagre traffic. For light branch line services railcars have been used to replace ordinary trains and, owing to the economy of their operation, additional services have been arranged and traffic receipts substantially increased. Similarly, for local services on main lines it has been found practicable to increase the number of trips available for the public, as, for example, between Lisieux and Deauville, 18½ miles covered in 20 min. with one stop, or 25 min. with one regular and five conditional stops. Along the Riviera, between St. Raphael and Menton, there is now an augmented service of railcars, and again on these local services we found all the cars very well filled. Owing to their quick acceleration and ability to maintain 60 to 65 m.p.h., their schedules are smart and there is no doubt that they are winning traffic for the railways.

In every field of their application the most usual type of power is the diesel engine, nearly always with mechanical transmission, but the petrol engine is also used to some extent, notably in the high-speed Bugattis on the Lyons and Le Havre services. The legal maximum speed of 75 m.p.h. has been raised to a maximum of 87 m.p.h. for the high-speed railcar which can, of course, negotiate curves with safety faster than the orthodox steam locomotive with its much higher centre of gravity. In this connection we may recall the trials made last November in Germany with a vehicle of the diesel-electric Flying Hamburger type to ascertain what increase of speed the low centre of gravity of such vehicles would permit on curves. During the tests speeds up to 106 m.p.h. were attained on the straight and on curves of very large radius. On sharper curves the following speeds were run: 1,000 metres (3,281 ft.), 120 km.p.h. (75 m.p.h.), 800 metres (2,625 ft.) 110 km.p.h. (68 m.p.h.); 600 metres (1,969 ft.), 95 km.p.h. (59 m.p.h.). France has been a pioneer of the high-speed long-distance railcar and deserves the thanks of foreign railway administrations for her initiative and enterprise. Although the first cost of the super-speed railcar is at present high it will doubtless be reduced as quality and quantity improve. It has been suggested that traffic density in certain countries would prevent the institution of certain of such services as those we have mentioned above, but we think it very probable that a careful examination of the timetables and, where necessary, some revision, combined with a stricter observance of punctuality than at present, would reveal unexpected possibilities. In our travels in France every one of the railcar journeys we made was exactly punctual throughout.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The New Pennsylvania Station, Philadelphia

West Hampstead.
November 17

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The picture in THE RAILWAY GAZETTE of November 9 (page 760) of the booking office at the new Pennsylvania station, Philadelphia, encourages me to urge the adoption of a similar type of booking office by the railway companies of this country. There is nothing more inconvenient or irritating than the wretched little holes through which we have to obtain our tickets and change, and the clerk in charge a shadowy figure with whom it is difficult to hold any converse.

Not only would the comfort of passengers be very greatly increased by open counters, but the amenities also of many of our stations vastly improved by the opening out of gloomy and old-fashioned booking halls. Our London termini might very well lead the way in this much needed reform.

Yours faithfully,
R. G. COX

[The chief difficulty in carrying out our correspondent's suggestion in British railway stations lies in the fact that our booking halls nearly always have unclosed openings to the atmosphere and this would make for intolerable conditions for the booking clerk. In the new Philadelphia station the booking hall is an apartment with proper doors and is properly warmed and ventilated. However, much could be done to improve ticket booking amenities by the provision of large glass screens instead of small ticket windows, such as have been provided at Harrogate, L.N.E.R. (see THE RAILWAY GAZETTE of August 17, 1934, pages 264 and 280-1). Many new and recently renovated stations in France have been treated in this way, to the mutual advantage of the railways and the public.—ED., *R.G.*]

Proposals for Improvements

99, Clifton Road, S.E.25.
November 18

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With regard to the superelevation problem alluded to by Mr. Carpmael during his recent address on railway speeds of the future, could not a solution be provided by means of bifurcations at the critical points, giving access, without any crossing of lines, to Siamese-twin tracks appropriately superelevated for fast and slow traffic?

If I might add a few words about the proposed relief line between Baker Street and Finchley Road, would not the value of this undertaking be almost doubled if it were extended for a further half or three-quarters of a mile to link up with the increasingly busy Edgware line at Hampstead?

Yours faithfully,
K. H. JOHNSTON

Romanhurst,
Bromley, Kent.
November 17

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I am keenly interested in the discussion reported on page 809 of your issue for November 16. Curvature round island platforms does spoil running and usually involves either sevele slowing or discomfort to passengers. I much regretted the diversion of the up fast line for the construction of Petts Wood station, and the same objection applies to the widened lines at Gidea Park on the L.N.E.R. The diversion of fast trains to the slow lines, with their tortuous curvature, through Bickley, Bromley South, and Shortlands, either hinders the punctual running of expresses or causes discomfort to their passengers—or both. In this connection it is to be hoped that with the widening of the Metropolitan and Great Central line from Harrow to Ricksmansworth the opportunity will be taken to ease the curvature through Rickmansworth station, which spoils the fast running of all the up L.N.E.R. expresses there.

The very interesting 4-8-0 streamlined express engine design on page 788 may give ideas to some of our locomotive engineers, for what is especially needed to-day is faster uphill running rather than extreme maxima down-hill, which sometimes produce uncomfortable travelling.

The article in your *Electric Railway Traction Supplement* on new British electrification schemes prompts me to express the hope that in connection with the electrification of the Nunhead-Lewisham loop the Southern Railway will put in the much needed crossovers between the South Eastern and the South London lines near Peckham Rye, and in this connection I cannot stress too strongly the need for the immediate construction of the long-proposed widened lines between Shortlands Junction and Peckham Rye, for lack of which main line trains have been running more than an hour late during this week's fogs.

Yours faithfully,
E. A. GURNEY-SMITH

The Railway Bed-Carriage

Tisbury, Wilts,
November 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Since the recent correspondence in your columns on this subject I have come across a contemporary reference to the Grand Junction Railway bed-carriage which shows, I think, conclusively that it was really the forerunner of the invalid carriage and not of the sleeping car.

In Osborne's "Guide to the Grand Junction Railway," first published in July, 1838, there is a description of the rolling stock in use, and it stated that "one of the compartments in the mails is capable of being converted into a bed, so that invalids may travel, in cases where before the establishment of railways it was impracticable."

As time went on separate invalid carriages were provided on the principal railways, but on some lines a first class compartment was still used, for in Murray's "Book of Information for Railway Travellers" published in 1865, it is stated that invalid boards, which are cushioned and constructed so as to fit between the seats of first class compartments, are provided on those railways which do not possess invalid carriages.

Your obedient servant,
REGINALD B. FELLOWS

Push-Button Point Operation

Great Western Railway,
Signal Engineer's Office,
80, Caversham Road, Reading.
November 12

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—May I point out a small error in the paragraph on push-button point operation on page 749, in the issue of November 9? The points at Banbury and Rogerstone are operated by compressed air and not by electric motor, the valve only being electrically operated.

Yours faithfully,
H. F. D. PAGE

PUBLICATIONS RECEIVED

Systematic Survey of Communications of Importance to the Working of the League of Nations at Times of Emergency. Geneva, 1934. —Following a resolution adopted by the Assembly of the League of Nations in 1925, which drew attention to the need of improving rail and long-distance telephonic communications with Geneva, the Transit Committee submitted in the next year a report on measures to be taken to ensure the full use of the existing facilities. From 1927 the same body has been represented regularly at the sessions of the International Timetable and Through Carriage Conference and has made periodical reports and recommendations. The agreements now obtaining with members of the League, arrived at as a result of these activities, are set out in the present publication. The major part of the book is concerned with air and motor transport, but the obligations under which the States Members are considered to be placed as a result of resolutions adopted by the Assembly and Council are summarised in a chapter on railway communications. The publication is obtainable in England from Allen & Unwin Limited, 40, Museum Street, W.C.1. Price 3s.

Railways for All. By the late J. F. Gairns. Fourth Edition. Revised and enlarged by J. Kenneth Taylor. London: Ward, Lock & Co. Ltd. 8½ in. × 6 in. × 1½ in. 320 pp. Fully illustrated. Price 6s. net.—It is a tribute to the form in which the late Mr. Gairns planned this book that it has so successfully undergone three phases of revision, losing nothing of its original qualities in the process. Revising "Railways for All" is very different from sewing new cloth on to an old garment, for the book adapts itself to extension of scope and modernisation of appearance as naturally as do the railways themselves. Even so, all might have been lost in the hands of an inept editor, and the publishers are fortunate in having had the services of Mr. J. Kenneth Taylor for this purpose. From his hands, the book now emerges in its fourth edition with as much freshness as when it made its first appearance, and possessing an initial advantage over all other railway books which may appear at this season in an established popularity and reputation.

To summarise the additions that have been made, it is necessary to remark only that all the major developments in British railway practice and operation that have followed the grouping are covered, together with recent progress on the Continent and elsewhere. Among the questions of universal railway interest, that of speed is dealt with in a manner as nearly topical as is possible in so swiftly changing a subject, several examples being taken from the 1934 timetables. This chapter, entitled "Famous Expresses of all Countries," presents a notable perspective of modern railway acceleration.

Descriptions and illustrations of the latest locomotives in this country and abroad, embracing even so recent a class as the L.N.E.R. *Cock o' the North*, are now included, and a number of recent features of design, such as the use of poppet valves, are dealt with. Since the last edition of the book, Great Britain has seen its first main line electrification, a subject which the reviser has treated very adequately both in regard to progress abroad and the schemes of the Southern Railway.

Diesel traction and the association of the railways with air transport are introduced conveniently (if not with permanent appropriateness) into the chapter headed by Mr. Gairns as "Some Railway Odds and Ends." With commendable topicality, the book now extends to the consideration of colour-light signalling, the L.N.E.R. marshalling yard at Whitemoor, and the Southern Railway plans for a cross-Channel train ferry. The illustrations have been considerably revised, and present a pictorial survey of modern railway practice which is fully in accord with the up-to-the-minute nature of the text. The index has been extended to correspond with the additional matter and is as helpful a guide to the book as ever. Smaller, but no less legible print, has enabled the inclusion of more matter in the same compass, and improves the appearance of the book.

Annual Report of the Central Publicity Bureau, Indian State Railways, for 1933-34.—From this report it appears that during the year under review tourist traffic generally showed an improvement over the previous year, though luxury tourist traffic—overseas tourists using special tourist cars—has fallen; this is probably due to the financial position in America. As opposed to two cruise ships in the previous year, three visited India during the year ended March 31, 1934. One of them, the *Gripsholm*, marked a new departure, in that it brought Scandinavian tourists to India. This is a development following the Indian tourist publicity campaign on the Continent of Europe. A notable increase in the work done by both the London and New York bureaux has been evident throughout the year and appears likely to increase materially in the near future. In spite of various attempts to estimate the value of tourist traffic from overseas to India, it has been found very difficult to arrive at a correct figure. There is, however, little doubt that for the past year Rs. 60,00,000 is a very conservative figure to be placed on the value of this traffic. There has, moreover, been a remarkable increase in inland tourist car traffic by people in India, as against tourists from abroad, this increase amounting to all but 50 per cent. Among the activities of the New York bureau may be mentioned the successful continuation of the lectures given by the Resident Manager, Mr. W. T. Biscoe. These numbered 69 during the year under review, and were attended by practically 14,000 persons in 27 towns, and in addition Mr. Biscoe delivered six broadcast lectures over the radio. A series of displays of films on India was also given in New York and Boston, and in the states of New Jersey and California throughout the year. Meanwhile the London bureau was represented at the British Industries Fair, at which the Queen was pleased to admire a collection of coloured pictures of Indian life displayed by the bureau. This bureau was also largely responsible for the *Gripsholm* Indian tour.

Travel Literature.—We have received from Thomas Cook & Son Ltd. three pamphlets which will appeal to the intending long-distance traveller. A programme of pleasure cruises for 1935 shows the sailings arranged for each month, and covers Scandinavia, the northern European capitals and Iceland, as well as the more conventional destinations. Four round-the-world cruises are scheduled for 1935, and there will be five cruises covering the Christmas season of the present year. The other handbooks deal with Africa and Egypt. "Travel in East Africa" is a handsomely produced guide to tourist facilities in that part of the continent. Rail, sea, and air communications are enumerated, together with the essential information applying to each. "The Nile Voyage" describes the journey by river steamer from Asyut to Aswan and Halfa, with particulars of fares, accommodation, and supplementary excursions.

Spiral-Electric Planers.—The Butler Machine Tool Co. Ltd., Halifax, sends an illustrated catalogue of Spiral-Electric planers, including machines of the openside and tandem types. The name is derived from the power transmission, which is exclusively by worm gearing, thus ensuring smoothness of operation, minimum backlash and an absence of tooth marks in the finished product. A patented system of forced field control, applied to a Ward-Leonard drive, is claimed to secure an increase in cycle production of about 20 per cent. compared with other reversing motor drives. The feed is also by reversing electric motor. Pendant push-button control and operating levers conveniently grouped on clearly-engraved panels are Butler characteristics which are well exemplified in the present range of machines. Super-Production planers with independent feeds, each unit offering a range of from $\frac{1}{50}$ in. to 2 in with nineteen intermediate stages, are also manufactured. Rail planers with specially-strengthened frames and tables, capable of removing the heaviest cuts with ease and without vibration, will be of particular interest to the railway user.

THE SCRAP HEAP

The Lighter Side of Cheap Travel in France

When commenting in our issue of October 5 upon a booklet of travel information recently issued to the staff of the P.O.-Midi Railway, we referred to the excellent illustrations with which the publication is enlivened. Several of these are now reproduced on this page, and show the skill with which the compilers have infused a judicious

degree of levity into what would otherwise be an unrelieved testament of beautiful but solemn truth.

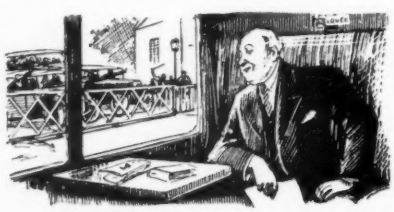
The first picture requires explanation. It is the duty of every P.O.-Midi employee, when faced with a question from a member of the public which he cannot answer, to refer it himself to the competent authority. The blunt confession of ignorance and the no less irritating reply that the subject falls outside his duties are properly taboo on the grounds that they "create a deplorable impression and drive people away from the railway." Hence the zeal with which the rustic is being ushered towards the inquiry office and the dawning confidence discernible upon his features.

The commercial gentleman with the cigarette-holder who illustrates the paragraph on facilities for business men is, for all his Napoleonic concentration, marked down to half price like one of his own remnants. If he happens to be a junior partner in a large concern his journey costs him even less, although the privilege is earned by paying down a lump sum for a voucher, which must be produced when a cheap ticket is asked for.

Similar reductions apply to the family. A patriarchal conception of the word is evidently entertained by the P.O.-Midi authorities and the example illustrated represents but a tithe of what can be conveyed at advantageous rates. The precise specification is: husband (optimistically referred to as *le chef de famille*) and wife; their parents and grandparents of as many generations as are in a position to travel; their children (married and single); their sons and daughters-in-law; their unmarried grandchildren. Each child under three years of age is entitled to a nurse, and families of from three to six members to two servants. Three servants may join in the tribal wanderings of vaster clans, numbering from six to ten.

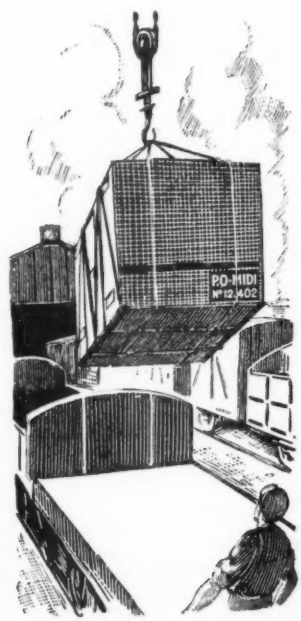
In view of this, the concession that allows the *chef de famille* to make solitary journeys at half fare during the period of his holiday has evidently been dictated by considerations of common humanity.

Traducers of the French, to whom the phrase "a week-end in Paris" appears inevitably to suggest high nocturnal adventure and melancholy aftermath, will be properly confounded by the sketch of filial piety which emphasises the attractions of week-end tickets. No less warming to the heart is the ineffable expression of benign superiority upon the face of the wise railway traveller who has reserved his seat, and is watching from his impregnable citadel the unseemly bickering of road users as they jockey for position at a level crossing.



Our remaining illustration is taken from the section of the booklet which deals with goods traffic. The pictures here are mainly in a less frivolous vein, but of an equally high standard, and we reproduce the full-page drawing accompanying the section on container transport. An interesting freight facility mentioned is the transport of agricultural produce direct to the customer, a measure aimed at reducing the cost of living in towns.

Were a booklet of this type and temper made available to the public, it is probable that the railways would be rewarded not only with new patronage but with a new respect, for the increasingly grim business of journeying by road is undoubtedly tending to deprive travellers of the good humour and tolerance which are their proper attributes.



OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Rhodesia Railways attracting steamer passengers from Beira —Job analysis throughout India—Damage to railways in Spanish revolt—Tropical climate test room in Germany— Future of the Vienna-Budapest express service

RHODESIA

Improved Train Services

A considerable increase in the number of scheduled goods trains, due to the steady rise in traffic, is the feature of the latest Rhodesia Railways timetable in force since September. Certain improvements are made in passenger train services, of which the acceleration of Saturday's mail train from Beira to Bulawayo by nine hours is the most striking. Passenger accommodation is now provided on certain fast through goods trains, thus affording a daily service in each direction over the main line from Beira to Bulawayo. It is hoped that the new daily train between the seaport and Umtali will do much to stimulate tourist traffic between the two centres, and efforts are being made to attract ships' passengers on short excursions during the ship's stay in Beira.

Rhodesian-trained Gangers

Owing to the extremely limited supply of local men suitable for engagement as gangers, the Rhodesia Railways have recruited many for this grade from older established railways and even from overseas. Rhodesian-born boys are now leaving school in ever-increasing numbers, and the railways have decided to experiment with a view to training suitable lads to become first-class track men. A good many vacancies for gangers are expected to occur within two or three years, and a squad of sixteen "learner gangers" has been formed, all about 21 years of age, who are taking an intensive course of practical training on certain sections of the main line. In Rhodesia a ganger is in charge of native unskilled manual labour, but the learners are carrying out the whole of the pick and shovel work of a gang, as well as other duties, to familiarise them with the best way of handling track tools. The gang is showing great keenness in the work, and after three months' experience it was estimated that the rate of working was twice that of a native gang and the quality two or three times as good. Every day a different learner is put in charge of the work, and is responsible for the observation of trolleying regulations under the supervision of an experienced ganger. From time to time talks are also given on the theoretical details of the work.

A second gang of apprentice gangers has now been formed of boys of 16 to 18 years who are stationed at Bulawayo. Their length of apprenticeship will be five years, of which three years will be spent as a gang performing all types of work without native assistance, and the remainder of the training will be spent on selected gangers' lengths. A block of quarters, with communal dining and recreation rooms, has been provided by the administration rent free, and only a small charge is made for food which is prepared in accordance with a balanced diet sheet under the supervision of an European warden who is in charge of the quarters. This experiment in training Rhodesian youth is being watched with much interest by the general public, and the progress made so far augurs well for this new avenue of employment on the railways.

INDIA

Progress of Job Analysis

In February last, the Railway Board placed before the Standing Finance Committee for Railways a memorandum summarising the results of the job analysis inaugurated on various railways in accordance with Mr. Pope's recommendation. Since then further reports from certain railways, giving the progress of the work up to the end of the official year ended March 31, 1934, have been received by the board and these have been summarised in a note which was recently submitted to the Finance Committee.

North Western and Eastern Bengal Railways

Job analysis on the North Western Railway cost Rs. 32,000 in 1933-34, and has effected a saving of Rs. 12,66,749, the economies under Maintenance of Way and Works alone amounting to Rs. 5,23,629. The bill for this head of expenditure generally represents 15 per cent. of the working expenses of railways. A further sum of Rs. 2½ lakhs has been saved by careful analysis of shunting and other activities at stations. Analysis is still being continued in various directions and an important investigation aiming at further co-ordination of all mechanical workshops is expected to be initiated shortly.

The cost of job analysis on the Eastern Bengal Railway amounted to Rs. 63,000, while the savings are conservatively estimated at Rs. 2,14,864 for the whole year, mostly in wages. A detailed investigation into the maintenance of block signal instruments and fixed signals showed that the whole work could be carried out with considerably less staff. The savings effected under this head amounted to Rs. 38,000. As a result of investigations into the better use of locomotives and rolling stock, the daily mileage of locomotives in two districts has been substantially raised, while on the Calcutta suburban services it has been found possible to provide more trains with less coaching stock. These analyses are still proceeding. Savings are also expected from a reduction in the purchase of high grade coal.

On the B.B. & C.I. Railway, the cost of job analysis during 1933-34 is estimated at Rs. 58,789, and the annual savings recommended and accepted are put at Rs. 3,52,862, the intensive use of locomotives and the reduction of expenditure in certain workshops and traffic stations being the main heads of economy. Further progress in analysis will be reported to the Standing Finance Committee from time to time.

East Indian and G.I.P. Railways

On the East Indian Railway, the total savings effected during the year exceeded Rs. 7 lakhs, as certified by the Chief Accounts Officer. Economies in expenditure on fuel, by substituting cheaper for more expensive coal and obtaining coal from nearer collieries, better utilisation of scrap metal and reduction of staff accounted largely for the savings. The cost of the job analysis organisation during the year amounted to Rs. 77,691. Investigations under 20 separate heads covering a wide range of railway operations are also in progress.

On the G.I.P. Railway, the cost of job analysis during the year amounted to Rs. 56,680 and the savings effected to Rs. 4,29,482, chiefly in wages. No fewer than 136 separate investigations, covering many widely divergent activities, have been started. The Nagpur division has been merged in the Bhusaval division. Important developments in the intensive use of locomotives are forecast.

Railway Purchases by Indian Stores Department

The value of purchases made by the Indian Stores Department for the railway administrations during the year 1933-34 amounted to Rs. 1,76,05,708, against Rs. 1,52,77,478 in the previous year. The increasing volume of business entrusted to the department indicates its growing popularity. It is observed that the purchases on behalf of the State railways increased by

Rs. 24 lakhs, but the share of company-managed railways fell off by Rs. 88,000. The latter may have perfectly reasonable grounds for not extending to the Indian Stores Department as much of their business as do the State railways. In view, however, of the superior technical purchasing organisation that the I.S.D. offers, it is expected, that in the interests of economy, as much business as possible will be sent to the I.S.D. by Government and semi-Government organisations.

SPAIN

The Revolt and the Railways

The recent revolt in Spain has affected the railways to a much greater extent than was originally estimated. Now that the work of pacification and disarmament is practically complete in Asturias, the region which suffered most, the companies have been able to draw up a rough estimate of the monetary loss in damage to plant and equipment and in loss of revenue. In Catalonia the loss under both heads was slight, as the revolt lasted but a short time. In the rest of the country too, apart from Asturias, very little actual damage was suffered by the railways. In Asturias however, and especially in the country around Oviedo and Gijon, wholesale destruction was caused during the fighting, due not to sabotage, but to the efforts of the rebels to obstruct the progress of troops. In the case of the station at Oviedo, this was partly destroyed during the fighting, before the troops could dislodge the rebels from the premises, and from a train which they had ready marshalled for their retreat. In the district around Oviedo, the aspect of railway premises and track and rail and road bridges after the retreat of the rebels to the surrounding mountains was reminiscent of a country after the prolonged operations of a real war.

The engineers of the Northern of Spain Railway have made a rough calculation of the cost of repairing the material damage, and they estimate this will not be much less than ten million pesetas (say £280,000), but the work will have to be done gradually, and spread over a considerable period. To this must be added the serious loss of revenue, not only in the past but also owing to the fact that it will be some time before the Asturian coal mines can resume normal working. This loss of revenue to date will mean for the Northern Company some five million pesetas (£140,000). The Madrid, Saragossa & Alicante Company suffered very little material damage, but the dislocation of traffic has been reflected in a serious drop in receipts. All in all, the revolution has cost the two principal companies alone something not far short of 22 million pesetas, or about £600,000 at present exchange.

ARGENTINA

A Projected Inter-Provincial Canal

An ambitious project has been submitted to Congress for the construction of a navigable canal, 750 km. long, from San Francisco, in the Province of Salta, to Barranqueras, a port on the Paraná River, served by the Santa Fé Provincial Railway. It will run parallel with the Bermejo River, and is estimated to cost some $80,000,000 paper. As such a scheme would inevitably divert from the Embarcación-Formosa and Metan-Barranqueras State lines, which serve the zone in question, a considerable portion of the heavy timber and petroleum traffic at present carried by them from the north to the port of Santa Fé, the State Railway authorities can hardly contemplate it with indifference. Apart from the diversion of traffic from the Government's own lines, it should be remembered that the Provinces of Santa Fé, Santiago del Estero and Tucumán are served by the Central Argentine, Cordoba Central and Santa Fé Provincial Railways, while the Provinces of Salta and Jujuy, together with the adjoining territories of Formosa and Misiones, are served by State Railway branches.

Buenos Aires Port Works

An important extension to the new section of the Port of Buenos Aires is covered by a project submitted by the Department of Navigation and Ports, for the construction of a new landing stage and accessory buildings to replace those existing in the north basin, where the installations have long been inadequate to deal with the overseas passenger traffic. It is proposed to defray the cost of the new buildings, estimated at some $3,277,000 paper, by means of a special charge levied on passengers, visitors and vehicles, which would permit of its amortisation within 10 years. The Director-General of Navigation and Ports has solicited authority to call for tenders for the framework of the buildings, estimated to cost $867,031 paper.

GERMANY

A Tropical Climate Test Room

A tropical test room, which is said to be the only one in Europe, was recently installed in the works of Siemens & Halske, of Berlin. Climatic conditions of the tropics are truly reproduced, as will be seen from the following description.

The materials to be tested are first taken into an anti-chamber and kept there in dry air until they have assumed the temperature of the chamber, which is maintained at 42° C. (107·6° F.). They are then transferred to the test room proper, which has a temperature of only 40° C. (104° F.), but is saturated with moisture to the extent of 97 per cent. This is twice as much as will occur under most unfavourable conditions such as prevailing on the island of Celebes. The tropical chamber is provided with steam heating under the ceiling to prevent water from dripping down, and the moisture is generated by a hot water sprinkling device. The temperature is automatically maintained constant in the daytime and allowed to drop to 35° C. (95° F.) in the evening. Already at 37° C. (97·5° F.) the room is over-saturated with moisture, and a fine dew finds its way into the smallest openings and crevices in machinery and apparatus and into the pores of materials. Next morning the air is again heated to 40° C. (104° F.) and this gruelling cycle very quickly reveals whether anything is suitable for use in the tropics or not. Wood, for instance, stands this climate for a short time only; plywood falls to pieces within a few days. Very varied materials and finished articles are tested. Special attention is attached to electric coils, which are tested under normal load. It is often found that the insulation is destroyed by electrolytic processes. The experience thus gained is a very important factor in the construction of relays and all other delicate electrical equipment for the tropics. The various methods of surface finish and surface protection, as well as questions of impregnation, storage equipment and packing materials, also come within the scope of the tests, and it will readily be understood that the test room greatly benefits all industries.

Continuous Welded Rails

On the Berlin-Hamburg line, where the highest speeds in Germany are run, there are some 60-metre welded-joint lengths of rail. Continuous welded rail lengths of 480 m. (1,578 ft.) are being used on the Saar railways. It is stated that, according to experience to date, there is nothing to prevent the use of still longer welded sections, and that the welded joint will become the general practice ere long.

A New Method of Securing Rails

A new method of securing rails to sleepers has been patented in Germany. It consists of straps to which the sole plate is fastened, encircling the sleeper, and thus avoids the necessity of drilling holes in the sleeper at the points where it has to sustain the highest stress, namely, where it carries the rails. The new method is suitable for any type of sleeper, wooden, steel or concrete.

AUSTRIA

Proposed High Speed Diesel Service between Vienna and Budapest

It is reported that the negotiations regarding the introduction of a fast service between Vienna and Budapest maintained with Hungarian diesel coaches have advanced no further, as there is some hesitation on the part of Austria in regard to foreign motor units running over Austrian sections, and thus creating a precedent.

IMPROVED CONDITIONS OF STAFF IN SOUTH AFRICA

Our special correspondent in the Union contributes an outline of the scheme as prepared by the South African Railways and Harbours Administration

Full details are now available of the Railway Administration £250,000 staff improvement scheme, which became operative from October 1. The broad principles involved in this scheme are:—

(1) Improved methods of recruiting staff.
(2) Elimination of intermediate grades and classes to enable railwaymen to enjoy the benefit of higher rates of pay at an earlier age.
(3) Accelerated progress to enable members of the clerical and daily-paid staffs to reach a rate of pay which can be regarded as fair remuneration for married persons.
(4) Elimination of "dead-ends" for the benefit of young men.
(5) Need for competitive examination in connection with the filling of all vacancies in the grade of probationer clerk.

Clerks

The improvements in grading involve the abolition of Grade V, and the new schedule for clerks, audit inspectors and telegraphists is as follows: Probationer clerks and telegraphists will rise to a maximum of £84 per annum after six months' probationership. They will then enter Grade IV and rise to £150 on a scale for age to be determined later. After £150 they will receive three yearly increments bringing them to £210. On entering Grade III they will receive yearly increments of £24, £24, £24, £18, £12, £12, and £6, bringing them to a maximum of £330, which is £15 more than the existing Grade III maximum. The effect of these changes is that those who enter the service at or below 21 years of age will be able to earn a salary of £258 at 26 years of age. Clerks who have been one year or over at £315, and stationmasters who are in a similar position, were advanced to £330 as from October 1. Credit is also given for any increment earned on the old scale of £15 between the last incremental date and September 30, plus a special adjusting increment of £6 per annum as from October 1. Adjusting increments to the next notch under the new scale will be given in a proportionately shorter time.

The remaining clerical grades have been fixed as follow: Grade II, £345 to £385 in three years; grade I, £405 to £445 in two years; senior clerk (II), £465 to £505 in two years; senior clerk (I), £525 to £585 in three years. The position of women typists, women clerks and women telephonists has been considerably improved and the ultimate maximum for the highest class of work has been raised to £300. New grades are: Grade II, £72, minimum, to £200, maximum, by increments of £12; grade I, £201 to £240 by increments of £15; special grade, £241 to £300 by increments of £15.

Stationmasters

Grade IV, stationmasters and relief stationmasters, have been placed on a scale corresponding with the revised maximum for grade III clerks. They start at £220 and work up to £283 (which includes free quarters). Other grades for stationmasters are rated as follow: Grade III, £295 to £330; grade II, £345 to £380; grade I, £400 to £430; grade Ia, £450 to £475; special class (II), £476 to £514; special class (I), £515 to £555 (all including free quarters). Grade III relief stationmasters get from £295 to £330; grade II from £345 to £380 and grade I from £400 to £430.

Draughtsmen also come in for their share of benefits, pupils starting at £130 and rising to £200. The grade of junior draughtsmen has been abolished and replaced by a grade III, which runs from £220 to £300 per annum in £20 increments. Grade II has a scale of £320—£20—£410, and grade I, £430—£20—£500. Indentured engineering and transportation pupils have been restored to the pre-depression scale of £235 for the first year, £282 for the second, £330 for the third and £450 for the fourth.

Artisans, Electricians and Skilled Labourers

The basic rate for skilled artisans is raised from 2s. 3d. to 2s. 4½d. an hour, while the rate for forgemen has been increased from 2s. 4½d. an hour to 2s. 6d. The rate for a leading hand will be 2s. 7½d. an hour and that for a chargeman 2s. 9d. Rates for electricians and fitters employed on district duty, and traction linemen, who were formerly in receipt of £25 5s. a month, are increased to £26 15s. Skilled labourers have been re-grouped into nine classes as against 14 in the past. The hourly rate of pay is raised from 1s. 1¾d. to 1s. 4d. for Group I, while the highest grade will carry 2s. 3d., instead of 2s. 1½d.

Enginemen and Guards

In the case of engine drivers, there are now three classes instead of four. The second class scale is from 15s. to 17s., and the first from 17s. 6d. to 19s., while the special class remains unaltered. Under normal progress the maximum rate will now be attained at the end of six years instead of after seven years as previously. The old rate of 13s. 9d. a day for passed firemen and passed drivers' assistants has been withdrawn and replaced by a scale which yields 13s. 6d. per day in the first year, 14s. in the second and 14s. 6d. in the third. Firemen and drivers' assistants are placed on a new scale enabling them to reach their maximum in one year less than formerly. There are now only three classes of guards and ticket examiners instead of four. The special class remains on the old maximum of 15s. 6d. a day, but the new scale enables these employees to attain the maximum within eight years instead of ten.

In the case of railway grades employed at daily rates, increments have been raised in many instances from 6d. to 9d. per day, and unnecessary classes have been eliminated. Bridge foremen have been raised from £35 to £37 10s. per month.

Competitive Examinations

The railway circular embodying these new scales also deals with the competitive examination which has been introduced in connection with the filling of all vacancies in the grade of probationer clerk. It is open to youths not over the age of 22 years and is confined to those with Junior Certificate or a higher standard of examination. The examination will be held once a year, and the intention is that 50 per cent. of the vacancies will be filled from among successful candidates in the service and 50 per cent. from outside.

The administration's policy is to fill the vacancies in the graded establishment from among its European labourers, who are now classified in two groups—those employed on work not of purely labouring character and those who are just labourers. The first group is recruited from suitable unmarried applicants, not over 21 years of age, who possess educational qualifications not lower than the sixth standard. Labourers under this group are not allowed to marry until they have served at least three years or until they attain the age of 21. It is from this group that vacancies in the graded establishment are being filled. The other class of labourers is no longer required to produce a Standard VI certificate, nor need the instruction be enforced that they must be unmarried. "Only those who are absolutely fit physically are to be engaged" says the circular, which adds that "bone and muscle rather than educational qualifications are the primary consideration for these men." Engagement in this class is confined to men between the ages of 21 and 35. "The object of these changes," adds the circular, is to accelerate incremental progression so as to relieve a certain amount of stagnation and to enable the lower grades of the staff to receive a reasonable rate of pay at an average marriageable age."

Harbours Staff

Big improvements have also been made in the conditions of the harbour and floating staff. The details of the whole scheme reveal that every section of the staff receives substantial benefit, and the administration's policy of aiding the probationer and junior members will doubtless be specially welcomed.

MANIPULATION OF PASSENGER CARRYING STOCK ON THE L.M.S.R.

An outline of the arrangements adopted by the London Midland & Scottish Railway for ensuring the maximum use of passenger rolling stock

OF the many branches of railway operating, that concerned with the manipulation of passenger stock is one of the most important, because the railways are judged to a very great extent on the punctual running and comfort of their passenger trains. The punctual departure from the starting point, the correct formation of the train, and the most suitable types of vehicles for the particular journey, require successful manipulation of the stock.

A moment's reflection on the multiplicity of factors which must be taken into consideration in this branch of railway work makes it apparent, even to one unacquainted with the operations of a great railway, that it is a problem more intricate and complicated than the absence of failures might at first suggest.

For example, all the alterations in the working timetables have to be carefully studied ; even a few minutes later arrival time at a station may mean that another set of coaches must be used for subsequent working from that point, and necessitate new arrangements for a whole sequence of trains. The layout of stations, and the necessarily different working arrangements, are important factors which must be considered in connection with the " platforming " of vehicles, and it is not merely a mathematical problem to obtain a subsequent working for a set of coaches on the next train leaving a station after its arrival. Facilities for the regular cleaning and repair of vehicles have to be arranged. During the winter months a sufficient amount of daylight running must be obtained in the case of electrically lighted stock to ensure the accumulators being sufficiently charged to maintain the necessary lighting during hours of darkness.

Arrangements have to be made to strengthen trains with additional vehicles, sometimes for the complete journey and sometimes only intermediately ; in the case of residential trains this is usually a daily obligation to meet the rush periods, in other cases it is only necessary on certain days, such as market days, early closing days, and so on. Football matches and special events necessitate the strengthening of regular trains in addition to the running of excursion or special trains ; even changes in the habits and pastimes of sections of the population must be watched and catered for. To quote two widely different developments in this respect, greyhound racing and cruising holidays, these as well as many other events—some regular and some irregular—induce travel by rail, and it is important in the manipulation of railway passenger stock to anticipate the requirements and provide the most suitable type of stock for the occasion in order to encourage such travel.

The London Midland & Scottish Railway, which operates the greatest length of line in Great Britain, runs more than three million regular passenger trains annually, and carries something like 420 million passengers. For this purpose some 18,000 vehicles of various types are used, with 132,000 first class and 960,000 third class seats.

On the formation of the L.M.S. a considerable field for research into the different practices of the constituent companies presented itself, and inquiry led to the various methods being systematised into a uniform practice, which briefly may be divided under two main heads :—

(1) Diagramming: This is the working out of arrangements to cover the stock requirements for regular and pre-arranged special trains, and the " balancing " of coaches so that the provision of vehicles at the starting point becomes an automatic arrangement. Approximately 50 per cent. of the total passenger carrying stock is so dealt with.

(2) Distribution: This covers the actual ordering and working of the vehicles from point to point in order to meet actual requirements for special and excursion trains, duplication of regular trains, replacements of vehicles marked off for repairs, &c.

On the L.M.S., carriage diagrams (a specimen is shown in Fig. 1) are issued in loose leaf form by a duplicating process. The basis of the carriage diagram is the working timetable, and its purpose is to indicate to the staff whose duty it is to deal with passenger trains, how the stock for regular trains should be received and disposed of.

Different types of stock have to be provided for different trains ; that, for instance, used on the Royal Scot would, obviously, not be suitable for a local branch line or residential train. Thus has arisen the development of " sets of coaches." In many cases sets of two or more coaches are permanently coupled together and allocated to certain classes of work. There are many different kinds of set, the most important on the L.M.S. being :—

(1) Main line sets, consisting of the most up-to-date corridor or vestibule stock.

(2) Standard three-coach corridor sets, termed inter-corridor sets, and composed of a third brake, a composite, and a third brake.

(3) Standard three-coach non-corridor sets, termed inter-district sets, and composed similarly to (2) but of non-corridor stock.

(4) District sets, composed of two or more vehicles of types to suit the requirements of the areas within which they work.

In the loose leaf diagrams every set and every loose vehicle necessary to meet the requirements for all the trains scheduled in the working timetables is shown separately in the form of a circuit for each day's complete working. The circuits are numbered consecutively, and the previous and subsequent circuit working number is shown against each day's circuit. With some of the main line sets, working long distance trains, the diagrams are simple circuits, as, for example, where circuit No. 1 works No. 2 and No. 2 works No. 1.

It is not, however, such a simple proposition as this with the majority of sets. In comparatively few cases, indeed, is it economical or practicable to arrange a clear-cut turn round from A to B and B to A. The principal reason for this is that the diagrams have to fit in with the timetable, and not *vice versa*, and the timetables must of necessity be made to suit public requirements. Thus, if the working throughout of a certain inter-corridor set were traced, it would be seen that it commences its journeys, say, on Monday from point A, and, after working to point B, arrives at point C early on Tuesday. It then works a different circuit from C the same morning, and, after working various trains, it arrives back at B the same evening. On Wednesday it works another circuit, finishing at D. On Thursday it finishes at E, Friday at F, Saturday at G, and Sunday at H. The following week's working takes it in other and different directions, but it finishes up at A on Sunday night ready to start again with the original circuit from A on Monday. The cycle given as an example covers two weeks, and requires, say, 14 sets of coaches. In many cases the cycles are much wider. This is sound practice, because the object is to keep the stock running in ordered circuits with the minimum standing time, bearing in mind the neces-

sary stops for cleaning and general overhaul ; therefore, on the termination of a journey, the most economical use for the particular type of stock is sought, irrespective of whether it is in the direction from whence it started or not.

There are approximately 7,000 separate circuits in the L.M.S. carriage diagrams, most of them bearing a rela-

LONDON MIDLAND & SCOTTISH RAILWAY

..... Division

Diagram of Carriage Working

Circuit	Arrive	Depart	Complementary	
			Circuit	Stock

Fig. 1

tionship to other circuits, because the majority of trains are composite, that is, they convey regular vehicles for two or more destinations (such as the Royal Scot from Euston, which conveys vehicles for Glasgow, Edinburgh, Stranraer, and Aberdeen), or else they regularly convey additional vehicles for part of the journey. This leads to the necessity for the carriage diagrams to be columned, showing the complementary circuits and the stock engaged thereon.

So far as the principal main line trains are concerned, the complete formation is specially shown in a separate publication called the Main Line Marshalling Circular, which shows the carriage diagram circuit number for each portion of the main line trains, and reference thereto is shown in the carriage diagrams by the letter Y. In all other cases the complementary circuit number of stock additional to the main train is shown, and the details of the additional stock given in code. This method gives a clear indication to the operating staff at stations as to what stock they will receive and how it must be disposed of. The blank column at the right hand side of the carriage diagram (Fig. 1) is for office purposes to work out the details for an analysis, which is referred to later.

Graphs showing the standing time at stations (in alphabetical order) are prepared. These graphs show up in a concise form the standing time of 60 minutes and upwards of all regular vehicles at every station, and, together with the figures prepared on the diagrams, point to possible weaknesses and where economy may be looked for. Reduction in the standing time of vehicles has resulted in quicker turn-round and consequent saving of coaches. The specimen graph (Fig. 2) illustrates the principle. The black lines represent standing time with three similar sets of coaches. It follows that if by a re-arrangement of the working the black line of any one set could be extended to cover 24 hours, the circuit could be eliminated, and the set of coaches saved. Thus, by utilising circuit No. 2 to cover that part of the working of No. 3 between 6.0 a.m. and 9.0 a.m., and circuit No. 1 to cover the work of No. 3 between 2.0 p.m. and 7.0 p.m., circuit No. 3 could be cut out entirely. This principle has been extended by comparing the graphs of adjoining or near-by stations, and where it has been economical to do so, incur short empty mileage to effect economy in stock.

From the information entered in the blank column on the carriage diagram previously referred to, a complete analysis for each division of the L.M.S. is compiled as shown in Fig. 3. Its principal function is to facilitate administrative supervision of the results of diagramming. For example, an examination of column 4 of the analysis, *i.e.*, the percentage of spare to diagrammed vehicles, may indicate the possibility of saving coaches by alterations in the cleaning and maintenance arrangements, and lead to inquiry as to whether the relationship between the

ANALYSIS OF DIAGRAMMED CARRIAGE WORKINGS

..... Division Summary

	1	2	3	4	5	6
Title of set	No. of sets in stock	No. of vehicles in sets (including spare sets)	No. of circuits in diagram	Percentage of spare sets to diagram	Vehicle-hours per day	Average hours per vehicle per day

Col. 1 :—Number of sets shown in rolling stock records.
Col. 2 :—Number of vehicles shown in sets on rolling stock records.
Col. 3 :—Number of sets diagrammed in the diagram of carriage workings.
Col. 4 :—Arrived at by dividing the stock and diagram requirements by the number of sets diagrammed.
Col. 5 :—Arrived at by multiplying the total hours per week all sets work by number of vehicles in each set and dividing by 6 (days in the week).
Col. 6 :—Arrived at by dividing the total hours per week by 6 times the number of sets in stock.

Fig. 3

time available and the time actually occupied in cleaning and maintenance is the most economical in every case, and whether by alterations either in the cleaning and maintenance arrangements or in the diagrams to fit in with the requirements in this connection, any saving in coaches can be effected. In order to keep a tight hold of this phase of the subject, a return is required from each carriage cleaning depot after the re-issue of the carriage diagrams, showing :—

(1) Total time all diagrammed stock is at the depôt.
(2) Full particulars of the cleaning and other work regularly done.
(3) Remarks and suggestions for improved diagramming, &c.

In addition, the staff responsible for making the carriage diagrams work in close conjunction with those responsible for cleaning and maintenance arrangements, particularly when alterations are made in the train working.

The arrangements described above enable stock to be tightly diagrammed, and thus result in its most efficient use.

STANDING TIME OF PASSENGER CARRYING VEHICLE

Circuit number. ..... Station

nt. a.m. nn. p.m. p.m.
12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11

1
2
3

Fig. 2

GREAT WESTERN RAILWAY.

Capital £2,500,000 in Shares of £100 each.
Deposit £2. 10s. per Share.
☞ Subscribers will not be answerable beyond the amount of their respective Shares.

THE Line of Railway is described in the annexed Plan. It will be 114 Miles in length from Bristol to the point of junction with the Birmingham Line, near Wormwood Scrubs. The station for Passengers in London is intended to be near the New Road, in the Parish of St. Pancras. The Railway will pass close to Southall Cattle Market—through West Drayton, within Two Miles of Uxbridge, near to Slough, Maidenhead, Reading, and Wallingford, within Four Miles of Abingdon, and Ten of Oxford, (to both of which a Branch may easily be made,) thence to Wantage, South of Farringdon, close to Swindon and Chippenham (from which points Two Branches would communicate with Cirencester, Stroud, Gloucester, and Cheltenham on the North, and with Melksham, Trowbridge, Bradford, Frome, and Warminster on the South,) and through Bath to Bristol.

The Traffic in Passengers upon the Line is proved to be greater than on any other of similar extent in this Country. The advantages of the Commercial Ports at each end, with an intermediate Manufacturing District, depending upon supplies of Coal and Raw Produce from places connected with the Railway, are important features in the undertaking. Ireland and South Wales will largely contribute to the Traffic through Bristol, while the much-frequented Towns of Bath, Cheltenham, and Oxford, in addition to the beautiful scenery of Clifton, Reading, Maidenhead, and Windsor, cannot fail to attract an increasing number of Passengers to the projected Railway. The Line may hereafter be extended through Devonshire, and form a Main Trunk of communication from the Metropolis to the West and South West of England.

The Estimates of Cost have been proved to exceed the amount *actually expended* on similar undertakings. The prices of each separate work have been strictly examined by five eminent Engineers, who have proved them to be ample. The Contracts subsequently made for 58 miles on the London and Birmingham Railway, under good security for the construction of the work, and maintenance of it during twelve months after completion, confirm the testimony given by Messrs. Stephenson, James Walker, H. R. Palmer, Brunel, and others, as to the sufficiency of the Estimate.

The selection of the Line has been approved upon the strongest and best evidence. The general Inclinations of the Line are peculiarly easy. For 100 Miles, none will exceed 10 feet per Mile; 79 of which distance, between London and Wotton-Basset, will be nearly level. The Excavations and Embankments nearly correspond in quantity, and will only amount to about 8,000,000 Cubic Yards in 114 Miles.

The Tables of Revenue proved in Parliament, upon official documents for the Passengers, and upon unquestionable testimony for Merchandise and Cattle, have been printed, with the Extracts of Evidence, for general circulation. They show in detail that the annual amount received for Passengers, at Railway prices (which are only half the present average cost of travelling,) *excluding all short Passengers within 15 Miles of London*, will be £471,771 14 8
In like manner the receipt for Merchandise and Cattle will be 287,268 14 3

The Report has been industriously propagated, by opponents to Railways, that the expences on the Liverpool and Manchester Railway have been so great as to cause a loss to the proprietors. The value of the Shares (originally £100) being now £200, which price they have long maintained, with the regular payment of a Dividend from £8. 4s. to £9 per Cent. per annum, are substantial contradictions of the report sent forth by interested parties. To obviate, however, the inference which may be derived from the present value of the Shares, and from the amount of Dividend, the same opponents insinuate that the Directors of that Company are paying their Profits out of Capital.

The minute accuracy of the Accounts, printed in each half year, delivered to the Proprietors, and signed by the Chairman of the Company, is conclusive against such an accusation. It is thus noticed in their Report, on the 23rd January, 1833:—"It has been asserted, and repeated with "so much apparent confidence, that indifferent persons *might* imagine there was some foundation for the statement, that the Dividends of the "Company have been paid, not from the *Profits*, but from the *Capital* of the Concern. Though aware that this slander has been hazarded on "occasion of several of the declared Dividends, the Directors have hitherto considered the imputation unworthy of notice; nor would they now "have deemed it necessary to reply to so absurd an insinuation, if they had not understood that, in distant parts of the country, where the establishment of Railways is at present under discussion, and where the example of the Liverpool and Manchester is naturally referred to by the "advocates of similar undertakings, parties have hesitated in giving their support to the proposed schemes, on the ground alluded to, and appeared "to expect, from the Managers of this Concern, an official declaration on the subject. They beg leave, therefore, to state distinctly, that the charge "of paying Dividends out of *Capital*, is absolutely and altogether *groundless*. The total amount of Capital Stock, created from the commencement "to the 31st Dec. last, whether in Shares or by Loan, is *£1,024,375, every farthing of which has been expended on the Works*; the particulars of "each item being duly registered in the Company's Books."

The Statements, appended to this Document, are calculated to exhibit the actual returns, during the three entire years of operation, on the Liverpool Railway.

It is admitted that their expences have been unexpectedly heavy. The novelty of the undertaking, and the want of experience in adapting Locomotive Steam Power to Railways, have materially increased the disbursement amount.

If, however, it appears that, great as those expences have been, the Rates of charge to the Public for travelling and conveyance of Goods by Railway are reduced nearly one-half of the former cost, and that a Nett profit upon the gross Receipts has accrued of not less than £29. 2s. 11d. per Cent. on Merchandise, £49. 13s. 11d. per Cent. upon Passengers, and £59. 8s. 8d. per Cent. upon the Toll for Coals, no reasonable doubt can be entertained as to the prospect of an ample return upon a line of Railway comprising a great extent of Traffic—whether of Passengers or Goods. Previously to the opening of the Liverpool and Manchester Railway, the average number of Passengers daily travelling on the road was proved to be 450——450 Passengers per Day=3150 per Week. Distance, 30 Miles: aggregate number of Miles 94,500

N.B. This number has since increased more than threefold.

The present number of Passengers on the Great Western Road, (as shewn by the statement proved in Committee,) travel 544,352

This Comparison exhibits, when reduced to equal distances, a proportion of 6 to 4 in favour of the Traffic in Passengers, upon the Great Western, over that of the Liverpool and Manchester Railway; which is easily accounted for from the circumstance that the travelling in the one case was simply between two Towns admitted to be populous, while the other comprises the Intercourse, Eastward and Westward, of a most extensive Agricultural, Mineral, and Manufacturing District, in addition to that of the Cities of Bristol and Bath with the Metropolis (the latter alone, containing 1,500,000 Inhabitants, or one-eighth of the whole Population of England) which will still further be increased by the more distant Traffic from South Wales and the South of Ireland.

Applying the actual result of the Liverpool and Manchester Disbursements, as shewn in the annexed Tables, it may be seen that the

Receipt from Passengers *alone*, on the Great Western Road, as above stated, being	£471 770
The proportionate Expenditure would be	237,300
The Nett Profit	£234,470

would pay £9. 7s. 9d. per Cent. on £2,500,000, the Capital of the Company.

The Receipt for Merchandise and Cattle, in addition, being	£287,260
The proportionate Expenditure would be	203,539
The Nett Profit of	£83,721

would increase the Yearly Dividend to £12. 14s. per Cent.

This Statement, proved in the Committee of the House of Commons, satisfactorily shews that the Investment must be beneficial, even if the whole Traffic in Goods and Cattle were excluded from the calculation, and presuming (which is quite beyond belief) that no Coals would be conveyed upon the Railway; on the contrary, it may be safely asserted that the quantity of Coals would be very considerable, and the Revenue proportionably increased.

The application for an Act to construct the entire Line between Bristol and London will be made when Parliament meets. The Surveys and all Preliminary Measures are completed.

A form of Application and Agreement for Shares is subjoined, which may be addressed and forwarded by Post to the Railway Offices, either in London or Bristol.

No Deposit is required until the whole number is completed; and the liability is limited to £2. 10s. per Share until after the Act is procured, when the Shares will be Transferable.

RAILWAY OFFICE, 17, *Cornhill, London*, CHARLES A. SAUNDERS,
— *Corn Street, Bristol*, WILLIAM TOTHILL, } *Secretaries.*

Great Western Railway

PROSPECTUS.

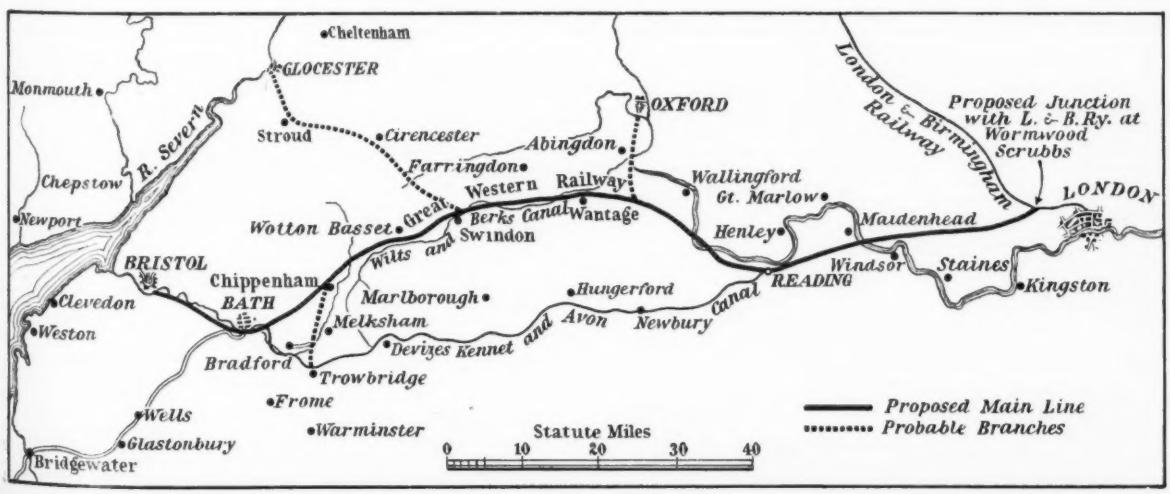
1834.

The third prospectus of the Great Western Railway was issued one hundred years ago. A facsimile reproduction is published on the opposite page

ON August 31, 1835, the Act incorporating the Great Western Railway Company received the Royal Assent, and August 31, 1935, will mark, accordingly, the centenary of the incorporation of the company. The title Great Western Railway was first adopted on August 19, 1833, instead of the original description of Bristol & London Railway, for a line between those points. It appears from Mr. E. T. MacDermot's "History of the Great Western Railway" that two schemes were put forward in the course of 1833. The first prospectus under the title "Great Western Railway" was issued about the end of August, 1833. This described a railway between Bristol and London with termini both in West and South London, but the scheme could not be proceeded with owing to lack of financial support. For financial reasons the next scheme was for two sections only, namely, London-Reading and Bristol-Bath. A circular explaining it was issued in October, 1833, and the Bill embodying it came before Parliament in 1834 but was rejected in the Second House. A third prospectus was issued in the autumn of 1834, asking for subscriptions towards the construction of a railway between London and Bristol. This is of particular interest, as it deals with a line substantially the same as that authorised by the Act of 1835, and forming the nucleus of the system which will attain its centenary next year.

Attached to the prospectus is an extract from the report of the Liverpool & Manchester Railway for the year 1833 (reproduced on pages 852 and 853), which, showing the substantial profits secured by that undertaking, would be likely to encourage investors to subscribe to the new venture. Basing their calculations on the results obtained by the Liverpool & Manchester Railway, the framers of the prospectus estimate on annual dividend from the operations of the railway between London and Bristol at £12 14s. per cent. Unfortunately these anticipations have never been realised throughout the history of the Great Western Railway Company. The best dividends paid have been 8 per cent. in 1845, 1846, 1922, and 1923. A very heavy traffic in passengers was estimated which was expected to produce considerably better results than from the conveyance of merchandise and cattle. A very decisive refutation is made in the prospectus of the insinuation that the handsome distributions made in dividends by the Liverpool & Manchester Railway were paid out of capital.

The authorised scheme provided for a junction with the London & Birmingham Railway near Wormwood Scrubs and for access thence to that company's terminus at Euston. Otherwise, the route to be followed to Bristol was much the same as that of the original main line via Swindon as we know it today. The Act of 1835 did not prescribe the gauge, and the 7 ft. gauge was eventually adopted when the independent access to Paddington was secured by an Act of 1837. The first section publicly opened was between London and Maidenhead on June 4, 1838. The 8¼ miles between Maidenhead and Twyford were opened on July 1, 1839, and Reading was reached on March 30, 1840. The section from Bath to Bristol was opened on August 31, 1840, and the whole line between London and Bristol was completed on June 30, 1841. Paddington station of 1838 was on the site of the present goods station, and the first passenger station on the present site was opened in 1854.



Reproduction of a portion of the map issued with the Great Western Railway prospectus of 1834

EXTRACT

OF

REPORT

OF THE

Liverpool and Manchester Railway.

LIVERPOOL, 23rd of JANUARY, 1834.

THE Directors in submitting to the Proprietors a statement of their accounts and proceedings for the Half-year ending 31st December, 1833, have to report a considerable increase in the general business of the concern, as compared with the corresponding Six Months of the previous year.

	Tons.
The total quantity of Merchandise conveyed in the Six Months between Liverpool and Manchester was	69806
To and from different parts of the Line, including Warrington and Wigan	9733
Between Liverpool, and Manchester, and Bolton	18708
Total quantity conveyed	98247
Quantity of Coal from various parts to Liverpool	32304
Ditto to Manchester	7830
Total to Liverpool and Manchester	40134

The number of Passengers booked at the Company's Offices		215071
The number of Trips of 30 Miles performed by the Locomotive Engines with Passengers was	3253	
With Merchandise	2587	
Total		5840

Compared with the corresponding six months of the last year the increase in Merchandise conveyed has been 11405 tons.
In Passengers 32248.

The following is the statement of the receipts and expenditure for the half-year; and subjoined are the usual tables exhibiting a detailed classification of the Disbursements.

HALF-YEAR ENDING 31st DECEMBER, 1833.

RECEIPTS.

Coaching Department		£54685	6 11
Merchandise ditto		39957	16 8
Coal ditto		2591	6 6
		£97234	10 1

EXPENSES.

Advertising	Account	£6	10	0
Bad Debt	ditto	374	10	1
Coach Disbursement	ditto	7138	16	9
Carrying Disbursement	ditto	8627	17	0
Coal ditto	ditto	82	0	9
Cartage (Manchester)	ditto	3173	18	0
Charge for Direction	ditto	312	18	0
Compensation (Coaching)	ditto	142	4	8
Compensation (Carrying)	ditto	223	10	11
Coach Office Establishment	ditto	632	6	8
Engineering Department	ditto	319	3	4
Interest	ditto	5140	6	4
Locomotive Power	ditto	13965	8	1
Maintenance of Way	ditto	6425	14	8
Office Establishment	ditto	722	6	2
Police	ditto	1022	7	6
Petty Disbursement	ditto	61	19	6
Rent	ditto	603	10	8
Repairs to Walls & Fences	ditto	665	3	4
Stationary Engine & Tunnel Disbursement	ditto	1307	16	6
Tax and Rate	ditto	3409	11	0
Waggon Disbursement	ditto	1611	0	3
Cartage (Liverpool)	ditto	80	17	10
Law Disbursement	ditto	300	3	9
				56360 1 9
Nett Profit for Six Months		£40884	8	4

Coach Disbursement: Guards and Porters' Wages, £1168. 4s. 6d.—Parcel Carts, Horsekeep and Drivers' Wages, £361. 1s. 7d.—Materials for Repairs, £689. 12s. 6d.—Men's Wages, repairing, £1041. 1s. 3d.—Gas, Oil, Tallow, Cordage &c. £196. 4s. 11d.—Duty on Passengers, £3224. 11s. 11d.—Stationery and Petty Expences, £277. 4s. 5d.—Taxes on Offices, Stations, &c. £116. 0s. 8d.—Guards' Clothes, £64. 15s.

Carrying Disbursement: Agents and Clerks' Salaries, £1728. 16s. 9d.—Porters' and Brakesmen's Wages, Horsekeep, &c. £5006. 6s 10d.—Gas, Oil, Tallow, Cordage, &c. £529. 17s.—Repairs to Jiggers, Trucks, Stations, &c. £366. 9s. 11d.—Stationery and Petty Expences, £429. 5s. 1d.—Taxes and Insurance on Offices, &c. £456. 17s. 7d.—Sacks for Grain, £110. 3s. 10d.

Coach Office Establishment: (Agents and Clerks' Salaries, £602. 6s. 8d.—Rent, £30.)

Locomotive Power: Coke and Carting, £3197. 4s. 4d.—Wages to Coke Fillers and Waterers, £348. 8s. 5d.—Gas, Oil, Tallow, Hemp, Cordage, &c. £865. 14s. 9d.—Brass and Copper, Iron, Timber, &c. for Repairs, £3755. 3s. 7d.—Men's Wages, Repairing, £4401. 4s. 10d.—Engine and Firemen's Wages, £784. 8s. 5d.—Out-Door Repairs to Engines, £63. 3s. 9d.

Maintenance of Way: Wages to Plate Layers, Joiners, &c. £2937. 19s. 2d.—Stone, Blocks, Sleepers, Keys, Chairs, &c. £2411. 2s. 4d.—Ballasting and Draining, £925. 16s. 11d.—New Rails, £150. 16s. 3d...

Office Establishment: Salaries, £607. 2s.—Rent and Taxes, £75. 14s. 3d.—Stationery and Printing, £22. 7s. 8d.—Stamps, £17. 2s. 3d. ...

Stationary Engine & Tunnel Disbursement: Coal, £302. 6s. 5d—Engine and Brakesmen's Wages, £319. 11s. 2d.—Repairs, Gas, Oil, Tallow, &c. £419. 15s. 5d.—New Rope for Tunnel, £266. 3s. 6d.

Waggon Disbursement: Smiths' and Joiners' Wages, £718. 19s. 7d.—Iron, Timber, Castings, &c £700. 9s. 1d.—Cordage, Paint, &c. £28. 5s. 2d.—Canvas for Sheets, £163. 6s. 5d.

1st JULY to 31st DECEMBER, 1833.

Disbursements apportioned under the different Heads of Expenditure.

	Per Passenger Booked.	Per Ton of Merchandise, Liverpool & Manchr.	Per Ton of Coal.	Per Ton on Bolton Tonnage.	Coaching Department.	Merchandise Department.	Coal Department.	Bolton Tonnage.	TOTALS.
	s. d.	s. d.	s. d.	s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Disbursements in the MERCHANDISE DEPARTMENT, consisting of Porterage, Salaries, Parish Rates, and Insurance, £456. 17s. 7d. Carting, Stationary Engine, &c. Disbursements	.....	3 9¾	.....	0 3¾	.....	15150 9 11	.....	249 0 8	15399 10 7
Disbursements in the COACHING DEPARTMENT, comprising Porterage, Salaries, Repairs, Duty on Passengers, £3224. 11s. 11d. &c. &c.	0 9	.....	.....	.....	7913 8 1	.....	.....	.....	7913 8 1
Porterage, &c. in the COAL DEPARTMENT, after deducting amount received for weighing Coal	.....	.....	0 0½	.....	.....	.....	82 0 9	.....	82 0 9
LOCOMOTIVE POWER ACCOUNT, proportioned according to the number of Trips of 30 miles in each Department, comprising Repairs of Engines, Wages, Coke, &c. &c.	0 8¾	1 6½	.....	.....	7779 0 1	6186 8 0	.....	.....	13965 8 1
SUNDRY DISBURSEMENTS, proportioned according to the Receipts as between the Coaching and Merchandise Departments, and according to the number of Tons and Miles conveyed, as between the Liverpool and Manchester, and Bolton Trade, comprising Maintenance of Way, Police, and Gate Establishment, General Office Establishment, &c. &c.	0 6¾	0 10½	0 1½	0 7	5532 0 2	3494 5 1	262 2 10	547 18 2	9836 6 3
RATES & TAXES, INTEREST on LOANS, and CHIEF RENTS, proportioned according to the Amount of Profit in each Department, calculated *exclusively* of these items of Disbursement	0 6¾	0 7¾	0 2½	0 1¾	6120 19 11	2526 6 3	411 1 5	95 0 5	9153 8 0
Total Disbursements	2 6½	6 10½	0 4½	0 11½	27345 8 3	27357 9 3	755 5 0	891 19 3	56350 1 9
Nett Profit	2 6½	2 10	0 11	0 5¾	27339 18 8	11283 19 7	1836 1 6	424 8 7	40884 8 4
Gross Receipts	5 1¼	9 8¾	1 3½	1 4¾	54685 6 11	38641 8 10	2591 6 6	1316 7 10	97234 10 1

From the foregoing statements of account it appears that the nett profits of the concern for the half-year ending 31st December last are £40,884. 8s. 4d.

Of this sum the Directors consider it expedient, as empowered by Act of Parliament, to appropriate 10 per cent. or £4,088. 8s. 10d. as a reserved fund, applicable to future contingencies; a measure which they trust will meet the approbation of the Proprietors, as tending to increase the permanent stability and consequent value of the concern.

To the remaining sum of	£36795 19 6
Must be added the balance from the Midsummer account	395 10 2
Making a total of	£37191 9 8
Out of this amount the Directors recommend to the Proprietors a Dividend of £4. 10s. per share, being	£35859 7 6
Which will leave a balance to be carried to the next half-year's account of	£ 1332 2 2

CHARLES LAWRENCE,
CHAIRMAN.

LIVERPOOL AND MANCHESTER RAILWAY.

Collated from their Official Half-yearly Statements.

Period.	PASSENGERS. No. of Passengers	Revenue	Expenditure.	Nett Profit.	MERCHANDISE. Tons of Goods.	Revenue.	Expenditure.	Nett Profit.	COALS. Tons.	Revenue.	Expenditure.	Nett Profit.
		£. s. d.	£. s. d.	£. s. d.		£. s. d.	£. s. d.	£. s. d.		£. s. d.	£. s. d.	£. s. d.
To 30 June 1831	188726	43600 7 5	19099 16 5	24500 11 0	42692	21875 0 1	16279 7 5	5595 12 8	2889	218 6 2	.....	218 6 2
31 Dec. ,,	256321	58348 10 0	25930 1 1	32418 8 11	65488	30764 17 8	22590 1 1	8174 16 7	8396	695 14 4	505 16 3	189 18 1
30 June 1832	174122	40044 14 7	21957 1 7	18087 13 0	72601	32477 14 0	23578 7 3	8899 6 9	29456	2184 7 6	1123 2 6	1061 5 0
31 Dec. ,,	182823	43120 6 11	23744 13 1	19375 13 10	86842	34977 12 7	23241 6 11	11736 5 8	39940	2804 3 4	1292 8 10	1511 14 6
30 June 1833	171421	44130 17 2	24746 7 9	19384 9 5	96457	39391 17 3	27314 18 9	11986 18 6	41375	2638 15 9	839 2 7	1789 13 2
31 Dec. ,,	215071	54685 6 11	27345 8 3	27339 18 8	98247	39957 16 8	28249 8 6	11708 8 2	40134	2591 6 6	755 5 0	1836 1 6
Total	1188484	283930 3 0	142823 8 2	141106 14 10	462327	199354 18 3	141253 9 11	58101 8 4	162190	11132 13 7	4515 15 2	6616 18 5
	AVERAGE.				AVERAGE.				AVERAGE.			
	Receipt for each Passenger ... 4s. 8¼d.				Receipt ₰ Ton ... ... 8s. 7¼d.				Receipt ₰ Ton ... ... 1s. 4¾d.			
	Disbursement ,, ... 2 4¾				Disbursement ,, ... 6 1¾				Disbursement ,, ... 0 ¾			
	Nett Profit for each ... 2 4½				Nett Profit ₰ Ton ... 2 6¼				Nett Profit ₰ Ton ... 0 5¾			
	Or, £49 : 13 : 11 ₰ Cent.				Or, £29 : 2 : 11 ₰ Cent.				Or, £59 : 8 : 8 ₰ Cent.			

GENERAL RESULT OF THE HALF-YEARLY STATEMENTS.

LIVERPOOL & MANCHESTER RAILWAY.

	Disbursements, exclusive of Interest on Loans and Capital.	Nett Profit on General Traffic, after paying Interest on Money borrowed.	Half-Yearly Dividend on Capital.
	£. s. d.	£. s. d.	
To 30 June 1831	32469 3 7	30314 9 10	£4 10 0 per Share of £100.
31 Dec. ,,	40691 16 5	40783 3 7	4 10 0 ditto
30 June 1832	43722 13 3	28048 4 9	4 0 0 ditto
31 Dec. ,,	47532 17 4	32623 14 0	4 4 0 ditto
30 June 1833	46288 11 2	33171 1 1	4 4 0 ditto
31 Dec. ,,	51209 15 5	40884 8 4	4 10 0 ditto
	261914 17 2	205825 1 7	
	AVERAGE. ₰ Ann. £87305	AVERAGE. ₰ Ann. £68608	

SOUTH AFRICAN RAILWAY PERMANENT WAY

An improved design of steel sleeper, which we illustrate alongside the present standard, was one of the Granet Commission recommendations

IN the course of its report on the South African Railways and Harbours, the Granet Commission made certain recommendations with regard to permanent way. While finding the permanent way and works generally well maintained in relation to the standard and density of traffic dealt with, it criticised what it considered to be a change of policy in regard to the 96-lb. rail suitable for a 22-ton axle load. It was in 1927 that the administration decided to raise the standard axle load on main lines from 18 to 22 tons (of 2,240 lb.), and at that time the policy was to concentrate the laying of this section of rail in continuous lengths where the traffic was heaviest. The Natal main line was thus selected as the first for complete conversion to the 96-lb. rail. Subsequently, however, this rail was laid on various sections of line instead of being concentrated on the Natal main line. The commissioners considered that the volume of traffic was not likely to justify embarking on a complete changeover of all the main lines from the old 80-lb. to the new 96-lb. rail for many years to come, and recommended therefore a reversion to the original policy of introducing 96-lb. rails in continuous sections in the following order:—

(*a*) 90 miles, Germiston-Witbank and deviations.
(*b*) 613 miles, Durban-Johannesburg-Braamfontein, including 92 miles of double line.
(*c*) 434 miles, Germiston-Bloemfontein-Naawpoort.

On the other main lines the 80 lb. rail should remain standard until traffic justified a change.

The important suggestion was then made that on both the 96-lb. and the 80-lb. track, where the latter was in

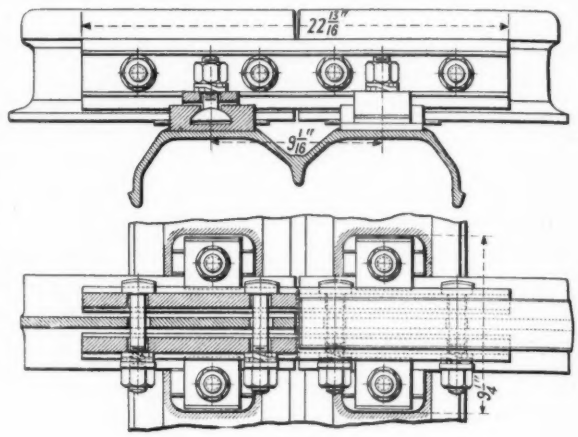
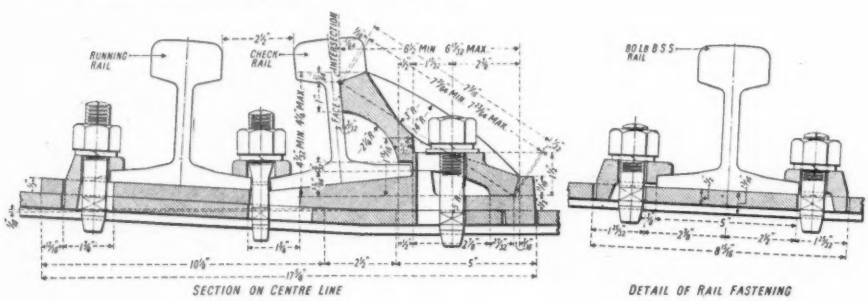


Fig. 2a



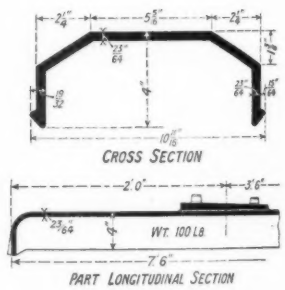


Fig. 2b

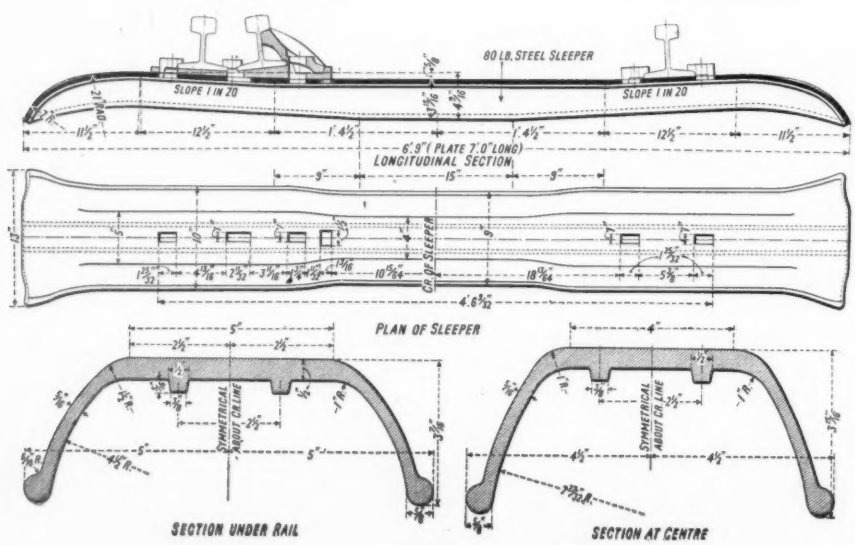


Fig. 1

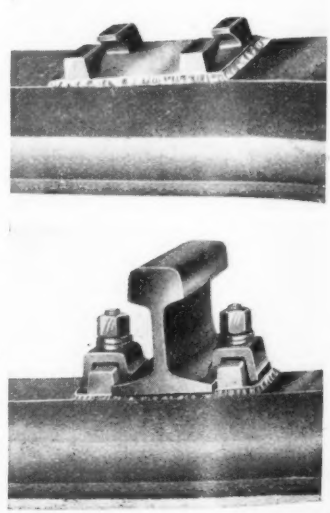


Fig. 3

good condition, every second and third joint should be butt-welded and twin sleepers should be introduced at the joints which were not butt-welded.

As to sleepers, it was pointed out that owing to the scarcity of suitable wood in country and the high cost of imported wood sleepers steel sleepers were now being used and the completion of the State Steel Works in Pretoria would doubtless further their use. That being so, it was of great importance to select the best possible type of steel sleeper, and the commissioners considered that the latest S.A.R. design, which had a tendency to slide on the ballast, could be improved by having straight lines instead of curved lines, and by eliminating punched holes on the railbed. The South African type of sleeper, as designed for 80 lb. rail section, is illustrated in Fig. 1, and the recommended alternative, which is in effect the standard German State Railway type of steel trough sleeper, with bearing plates welded on to it, in Figs. 2*a* and 2*b*. The double joint sleeper will be noted. This type of sleeper is essentially strong in having no holes cut in it under the rail bearing and in having additional thickness where it is most required in the form of the bearing plates welded on to it to form a homogeneous girder. The fittings, which may be seen in greater detail in Fig. 3, consist essentially of a lug on the bearing plate, slotted transversely to the track so as to take the head of a bolt which slides into it, and a ⊓-section clip which straddles the lug and through which the bolt passes. The bolt is thus prevented from sliding out of the lug again, and, at the same time, it clamps the foot of the rail down to the bearing plate. Sufficient play is allowed to enable gauge adjustment to be made.

Herr Meyer, one of the Commissioners, makes some detailed remarks upon permanent way in an appendix to the report, laying special stress on the importance of attention to the rail joint which, of course, is the weakest part of the track. The welding of two out of every three joints, he remarks, can be done without any difficulty by the modern butt-welding or thermit-welding processes. Where a permanent set in the railends exists, it is recommended that the bent ends of the rails be elevated by jacks, and new or reconditioned fishplates with hump-backs should be used. Where the track is rerailed, the bent ends of the rails taken out should be cut off and two rails butt-welded together. Herr Meyer refers to the working loose of the bolts and clips of the existing fastenings of the rails to steel sleepers, and pointed out the advantages of the improved fastening illustrated in Fig. 3. He further criticises the inadequacy of the ballast in certain locations which did not come up to the standard laid down by the South African Railways. The height of the ballast ought to be at least 13 in., but in the case of steel sleepers he had found it to be in many instances only 5 in., while in the case of wooden sleepers it was even less, and indeed the sleepers very often were found to rest on the formation level itself, with no ballast between or underneath them. In many cases the ballast used was found to be too large for efficient packing.

WINTER ESCORTED TOUR OF INDIA

The Indian State Railways, in conjunction with the P. & O. Company, have arranged a remarkably comprehensive tour with all the advantages and none of the disadvantages of a conducted tour

A particularly interesting escorted tour of India (and Ceylon) has been arranged for the present winter by the Indian State Railways Publicity Bureau in London—and the railways themselves—in conjunction with the P. & O. Company and the American Express. The membership of the party will be limited and the term " escorted tour " is used only in the sense that all routine arrangements are being provided for, leaving to the individual traveller as much freedom as possible.

The tour leaves London to-day, November 23, by P. & O. mail liner, and after calling at Gibraltar, Marseilles, Malta, Port Said and Aden, Bombay will be reached. Two days will be devoted to sightseeing in Bombay with visits to the Towers of Silence and the Caves of Elephanta. The Caves date back to the 8th century. They are hewn out of the solid rock, and the largest is 130 ft. deep and contains the colossal statue of Shiva. From Bombay the party will proceed to Gwalior. The great fort of Gwalior is one of the most ancient and renowned strongholds of India and dates back to about the 6th century A.D. It is a fine example of Rajput architecture.

After Gwalior, a visit will be paid to Agra, which contains that crowning glory in marble, the Taj Mahal. Visits will be made to this world-famous shrine by moonlight and also by daylight. The Taj Mahal, however, is only one of the many interesting sights in and around Agra, and another, the deserted city of Fatehpur Sikri, will also be visited. Built by Akbar in 1596 to celebrate the birth of his son and heir, the great mosque and other superb specimens of the Moghul stonemasons stand to this day as a source of endless wonder and admiration to visitors. The most striking feature of the city is the great Gateway of Victory, the highest gateway in India. It towers to 176 ft. above the pavement and is built of marble and red sandstone.

Two days are then to be spent in Jaipur, the magic pink city of Rajputana, which with its wide streets and salmon-coloured houses is practically free from Western influences. The tourists will next proceed to Delhi, the capital city of all India, where ancient tombs and mosques as well as the wonders of New Delhi are to be seen. After two days in Delhi the party will leave for Lahore, where, in an ideal climate at this time of year, Christmas and Boxing Day will be spent. While in Lahore there will be an excursion to Amritsar, whose glory is the Durbar Sahib (the Golden Temple) wherein the Sikh chiefs reside when they come to worship.

The next city to be visited will be Peshawar whence an excursion will be made to the Khyber Pass. This great natural highway into India, through the almost impregnable mountain barrier of the North-West Frontier, is rich in historical association, and has from time immemorial been the route by which conquering hosts have passed into India. It is still the great trading route between India and Central Asia, and arrangements will be made for the party to witness one of the weekly caravan convoys. After the trip to the pass, the party will return to Delhi on New Year's Day for a stay of four days before proceeding to Lucknow, with its Mutiny associations. Benares, reputed to be the oldest city in India and certainly one of the most holy, will be the next " port of call."

Two days will be spent in Benares before proceeding to Calcutta, where the tour virtually terminates. Calcutta is now the second city in the British Empire. Four days will be spent here, during which time there will be an excursion to Darjeeling, the hill station, with magnificent views of the highest Himalayas, including Mount Everest and Kinchenjunga.

For those who can spare the time there will be an optional extension of the tour to Ceylon and so home *via* Colombo.

IMPRESSIONS OF OVERSEAS TRANSPORT

I—The departure from Southampton demonstrates the effectiveness of the measures taken by the Southern Railway to add to the natural advantages of the port

By A. W. ARTHURTON,
Formerly Secretary, British Railways Press Bureau

IMPRESSIONS of this kind can scarcely begin better than at Waterloo, from whose platforms over 600 special trains with ocean liner passengers have this year left for Southampton Docks. On the particular Saturday morning on which I started for my world tour, four special boat trains chartered by the Cunard, Cunard-White Star, Red Star, and Canadian Pacific Lines respectively were due to leave, and I am assured that this is by no means an uncommon number even at this slack time of the year. Southampton as a terminal and calling place for the great liners of the world is growing so rapidly in importance that numbers of special boat trains in either direction have to be arranged every month, and the arrangement of these requires a considerable amount of organisation in the Traffic and Docks Departments. Passengers, although far fewer than in the season, still number many hundreds, and the comfort and convenience of the special trains are a foretaste of the luxuries of modern travel awaiting them on their respective ships.

One is struck, however, by the piles of baggage on the platforms and wonders whether the advantages of the Luggage-in-Advance system have been as effectively explored as they might be. My own trunks were despatched to Southampton as Passengers' Luggage in Advance on Tuesday, and on Thursday I was advised that they had been delivered to the shipping company. It might be worth considering whether, in the case of liner baggage, it would be possible, on payment of a small extra fee, for the railway company to advise the passenger that his baggage had been delivered to the ship. It must be because he is loth to allow it out of his sight that a passenger puts up with the trouble and expense of taking his baggage with him, and an arrangement of this kind would give him the assurance he needs that he will not have to take his journey without his trunks.

The departure of a boat train, even for the Continent, always has, it seems to me, an element of sadness about it. Tears are very near the surface, as one can never be certain of the future and good-bye may sometimes mean for ever. In my own case the presence of a large number of colleagues and friends was particularly pleasing and the handsome parting gifts of these and others showed me that, unsuspected by myself, I had made some very warm friends during my railway service.

After a fast run to Southampton, and almost before we realised it, the vast white hull of the *Empress of Britain* loomed before us. Minor formalities having been complied with, we were soon on board and inspecting the luxurious accommodation provided on this really wonderful ship. At the same time, one could hardly fail to be struck by the facilities provided by the Southern Company along the quay for the despatch or reception of passengers and goods. Capacious waiting rooms, replete with every comfort, and other accommodation compare favourably with those at any other port.

Everything which can contribute to the comfort and convenience of travellers has been utilised in connection with the passenger accommodation. With these facilities at his disposition, the passenger can pass from the train across the shed to the quay and thence to the vessel, and remain the whole time protected from the discomforts of unfavourable weather. The motto of the Southern Company in connection with all its services is " the maximum of service with the minimum of inconvenience." These are considerations of the highest value to the travellers, and they partially explain the unequalled position of Southampton Docks in the maritime world.

Southampton has long been known as the premier port of the kingdom so far as passenger traffic is concerned. This is attributable in part to its natural and geographical advantages enabling the largest vessels to berth and land their passengers at any time without delay, but the manner in which these advantages have been turned to account by those controlling the undertaking has been largely responsible for the success which has been achieved.

The proximity of Southampton to London, which can be reached from the ship's side in just over an hour and a half, has proved an inestimable boon to the business community, as evidenced by the increasing number of trans-Atlantic passengers who make Southampton the commencing or terminal point of their voyage, and the Continental services of the Southern Railway steamers provide for such passengers the shortest and swiftest means of communication with Europe.

The *Empress of Britain* was berthed at the new quay which formed part of the Southampton Docks extension scheme. This quay wall, built on concrete monoliths weighing some 7,000 tons each, was described in THE RAILWAY GAZETTE of January 20 and July 28, 1933, when the new graving dock capable of accommodating a vessel up to 100,000 tons, and specially intended for the recently launched Cunard-White Star liner *Queen Mary*, was, it will be remembered, opened by H.M. the King. The quay was designed to accommodate vessels of the deepest draught, and berthing facilities are afforded for eight vessels of the largest size, which are enabled to lie afloat at all states of the tide. Facing the quays are eight large passenger and cargo sheds of lengths varying from 600 to 900 ft. and 150 ft. wide, built in pairs. These have been designed to eliminate every form of discomfort in so far as the ocean-going passenger is concerned, and adequate equipment is provided for the expeditious handling of every kind of seaborne freight.

Looking down from the height of the upper decks of the *Empress of Britain* on these sheds, it was interesting to notice that provision had been made, by means of a covered gallery or balcony running along the front of the building, for the friends of passengers who wished to wave their farewells to outgoing steamers.

LIGHT CONTROL AT HULL LEVEL CROSSING.—The power-operated level crossing gates, combined with street traffic light signals, which have been installed by the L.N.E.R. at Walton Street, Hull, were brought into operation on Monday last, November 19. The Walton Street level crossing is one of the busiest in the country, and this is the first occasion on which traffic lights similar to those adopted by municipalities for the control of street traffic have been used to facilitate the passage of road traffic over a level crossing. The installation was described and illustrated in THE RAILWAY GAZETTE of October 12 last.

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

The G.W.R. Applications to the Licensing Commissioners

THE G.W.R. again encountered opposition to its application for licences when appearing at Birmingham before the West Midland Licensing Commissioner on November 6 and 16. The objectors adopted the now familiar argument that before adding to their fleet the railway company should utilise the services of other operators. On this occasion, however, the objectors refrained from producing any witnesses. Evidence was given on behalf of the G.W.R. showing that in respect of a large percentage of railborne traffic, the responsibility for door-to-door conveyance rested with the company. The witness demonstrated the absurdity of introducing into the complex organisation required to cope with traffic in a place like Birmingham, any measure of compulsion to employ miscellaneous hauliers unfamiliar with railway requirements. It must, he stated, be left for the railway to decide on grounds of cost and expediency the extent to which resort was to be had to hired cartage. Mr. E. G. Woodward, representing the G.W.R., referred the court to the decision in the Ridgewell appeal which relieved operators who could show an increase in their own traffic from any obligation to utilise vehicles of other operators.

The old claim also that " maintenance " vehicles should surrender their identity certificates when undergoing long period overhaul was renewed. Great stress was laid by the objectors on the risk, if the increase in railborne traffic was not maintained, of the company's additional motors being diverted to competitive road services. It was urged that the applicants should be required to confine their normal activities to a small radius from each railway station and that if the licences were granted they should be granted as " B " applicants.

The observations of Colonel Redman, the West Midland Licensing Authority, are of special interest as determining certain important matters of principle. He was of opinion that Mr. Tee, on behalf of the company, had produced evidence as to increased traffics which accorded with general knowledge as to the published returns, and these figures had not been successfully challenged. If, he said, the railway companies provided vehicles to any extent for non-railborne traffic, he would not be happy to grant the licences asked for. He considered, however, the company should be entitled to deal with the traffic it carried at rates including cartage and found the company right in its contention that it should not be expected to hire other operators to do the work. As to the fear expressed on behalf of the objectors that the upward trend of railway traffic might not be maintained, when the additional vehicles would be utilised for open competition on the roads, provision must, in his opinion, be made for anticipated increases on estimates and even if the witness's statement that failing anticipated traffic the supply of additional vehicles would be postponed was not regarded as satisfactory, he felt that public interest outweighed any apprehensions on this score.

As to the type of licence which should be held, he felt

One of three Thornycroft Speedy chassis recently supplied to the São Paulo Railway Company and fitted with coachwork made in the railway workshops at São Paulo. It will be noticed that this coach differs in design from that illustrated in our issue of August 3 last in that the rear portion is not elevated

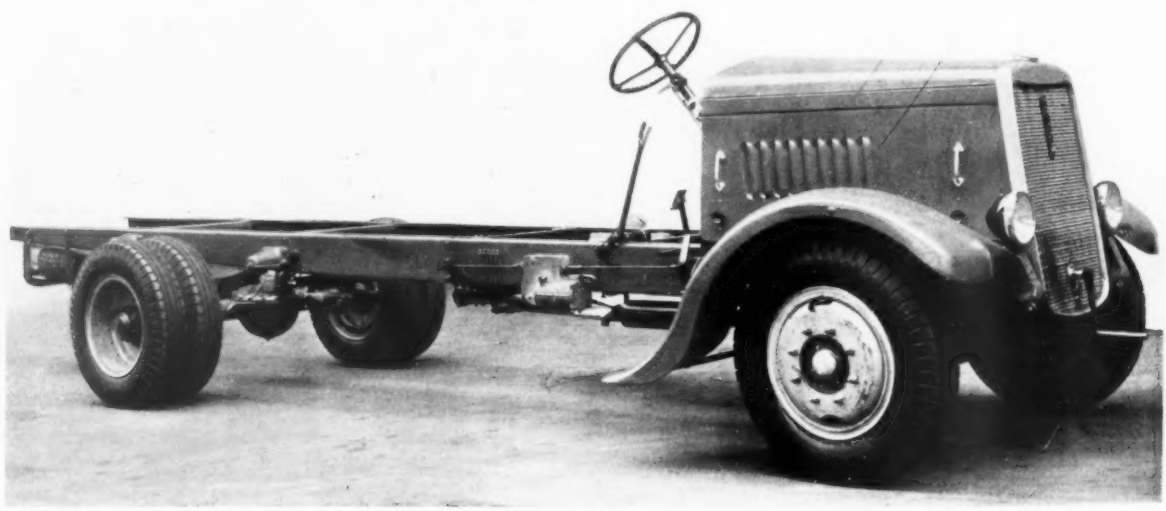
that at first sight it might appear that a "B" licence for discretionary vehicles with a condition limiting the area of operation would be appropriate. On the other hand, he accepted the argument for a mobile fleet of vehicles for seasonal traffic which would not be tied to individual stations and this precluded him from fixing a condition confining the carriage of goods for hire or reward to "railborne traffic within twenty miles of the station." "A" licences had, moreover, already been granted for claimed and discretionary vehicles in other areas and for claimed vehicles in his own area and conditions such as those indicated would afford no protection to road hauliers. He considered, however, that when the question arises of renewal in two years' time, "B" licences might be appropriate, as there will then be no question of claimed tonnage, and he suggested the railway company might review this point, which was one they had made in opposing other hauliers.

Finally, the Licensing Authority granted the whole of the licences asked for at bases in the West Midland Area, subject to those in four of the railway districts being re-published so as to show, instead of the central district base, the actual base at which the vehicles would be placed, but hinted that the position would be altered if the percentage of non-railborne traffic were to show an increase.

During the discussion on the types of vehicle which the company proposes to obtain, the licensing authority showed a marked dislike on safety grounds to trailers, and only agreed to license those asked for by the company in view of the special conditions obtaining in railway collection and delivery work.

A Halley Oil-Engined Chassis

ONE of the exhibits which has been attracting a good deal of attention at the Glasgow show during this week is the chassis which, weighing empty approximately 47 cwt., is designed for a gross load capacity of 95 cwt. It is powered with a Perkins Leopard four cylinder oil engine of 100 mm. bore and 127 mm. stroke, developing 30 h.p. at 1,000 r.p.m. and 60 b.h.p. at 2,400 r.p.m. A feature of this engine is the exceptionally clean offside, all the accessories being mounted on the other side where they are accessible.



The new oil-engined Halley chassis, fitted with a four-cylinder Perkins Leopard engine

The clutch is of the single dry plate type with an inspection door that enables any adjustment to be readily made when necessary. There is a four speed gearbox, the ratios being 5·27; 2·61; and 1·7 to 1, the top gear being direct, while the back axle ratio normally fitted is 7·25 to 1. The gear wheels are of oil hardened nickel chrome steel on short, sturdy shafts running in ball bearings and the box is provided with take-off doors, permitting the fitting of a mechanical tyre pump.

A full floating type rear axle is used, the casing being machined from a nickel steel stamping. The worm and worm-wheel are mounted in ball bearings and by withdrawing the driving shafts the worm gear and differential can be withdrawn without disturbing the axle. The wheels run on adjustable taper roller bearings.

The front axle is an I section stamping of high grade carbon steel and carrying robust stub axles and steering arms. The steering gear is of the cam and lever type, adjustable to take up wear and very light in operation. The radiator is of the gilled tube type, with detachable tube block. It is deep-fronted with a polished aluminium shield carrying a screening grid which gives it a smart appearance.

The foot brake assisted by a servo operates on all four wheels while the hand brake works on the rear wheels only. The springs are long and ensure smooth riding, especially in conjunction with the deep and strongly braced chassis frame.

The wheelbase of the normal control chassis is 15 ft., while that of the forward control type is 12 ft. 6 in., and the overall lengths are 23 ft. 9 in. and 20 ft. 4 in. respectively.

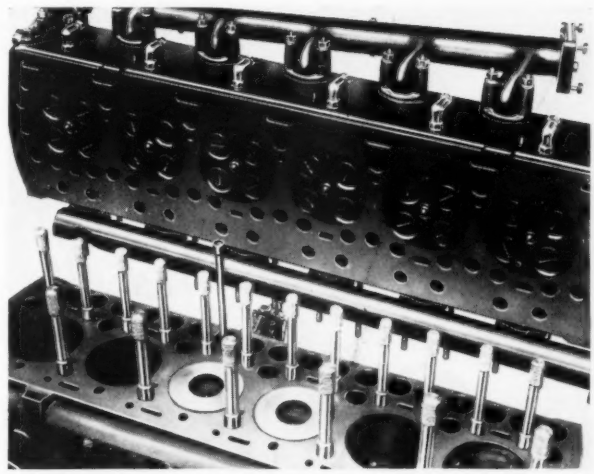
The Latest Armstrong-Saurer Oil Engine

New arrangement of valves to secure, in conjunction with a specially designed piston, complete combustion of the charge of oil. The dual turbulence theory

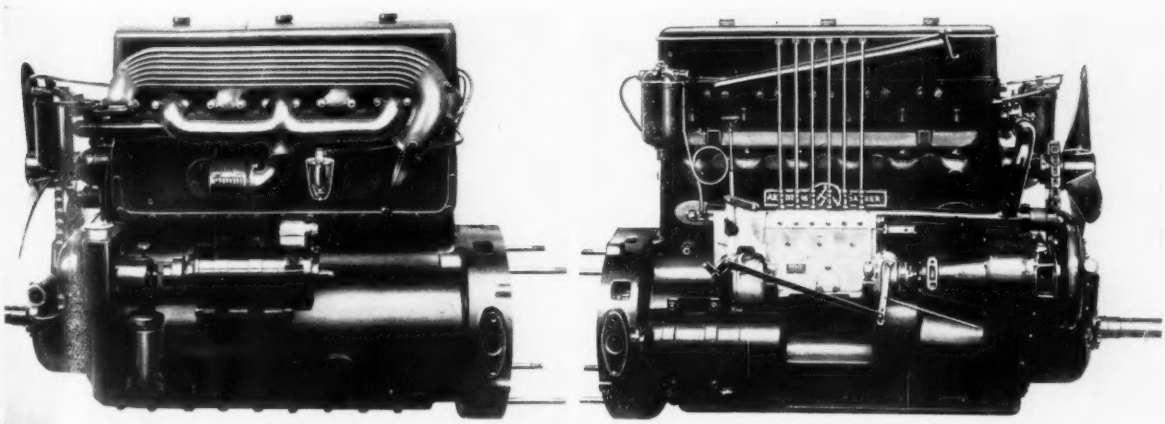
IT is generally recognised now that it is necessary to thoroughly break up the charge of oil as it enters the cylinder of a compression-ignition engine and considerable success has been achieved by the latest developments in the Armstrong-Saurer oil engine. The name Dual Turbulence has been given to this design and it indicates the line followed by those responsible for working out the theory. Briefly, it may be stated that the combustion space is in the top of the piston, that there are four valves for each cylinder and that the two inlet valves have shrouds placed so that they will give an initial swirl to the incoming air. The recess in the piston top is so designed that, as the piston rises into the horizontal swirl, the air is given a vertical swirl. The vertical motion varies in intensity according to the speed of the piston and it is claimed that perfect combination of movements of air results, so that, in effect, the fuel globules which are injected direct into the chamber when the piston is at the top of the cylinder are oxygenated and thoroughly scrubbed, enabling ignition to be effected with a considerably less delay period than has hitherto been obtained. Exactly how the scheme works can be followed from the diagrams, which we reproduce on the next page.

For the scheme of two inlet valves per cylinder, greater volumetric efficiency is claimed over the one valve type, while another advantage of having four valves is that the fuel injector can be comfortably located in the centre of the cylinder where, of course, it is in the best position to take advantage of the dual turbulence system. It is stated that the small valves employed require much less regrinding than the larger-sized valves ordinarily used, while the adjustment of the valve tappet clearances is a simple matter.

It is claimed that the thermal efficiency, on which fuel consumption depends, has been improved by as much as 33 per cent. while crankcase dilution has been eliminated and there is an absence of knock, smell or smoke. The new engine is being made in four cylinder and six cylinder types, and one of the latter, fitted in an eight-wheeled, Samson 22-ton maximum laden weight chassis, has recently undergone a four days' trial under



Below, a general view of the overhead valve gear on the new Armstrong-Saurer engine, and above, the head lifted to show the arrangement of the four valves per cylinder and the recesses in the pistons

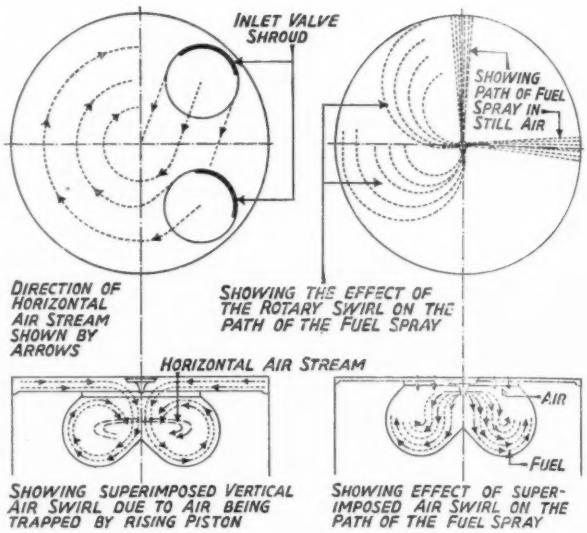


View from each side of the six-cylinder Armstrong-Saurer dual turbulence compression-ignition oil engine

the observation of the Royal Automobile Club. It covered 680¾ miles in four days, including about 20 per cent. in London traffic.

The vehicle was not allowed to exceed 20 m.p.h. and no coasting was indulged in. Yet the average speed worked out to 16·7 m.p.h. while the fuel consumption was at the rate of 9·64 miles per gallon or, taking weight into consideration, 211·9 gross ton miles per gallon. The fuel cost £1 2s. 4d. at the rate of 5½d. per gallon, and it was bought at filling stations on the road. Beyond replenishing fuel and water the only attention required in the four days was the clearing of an air lock in the fuel system, which took 18 minutes, and the verifying of the tightness of the retaining nuts on the road wheels, which accounted for another five minutes.

We were recently privileged to ride in a coach fitted with one of these engines and it was surprising to find how smooth and quiet-running is this power plant while it is also able to give an outstanding performance as regards speed and flexibility. As regards flexibility, we are informed that the six cylinder engine which is of 40 R.A.C. rating will give over 120 brake horse power at 2,000 revs. per minute, while the four cylinder model will give over 85 brake horse power under similar conditions. Examples of these engines are being fitted into the 8-wheeled Samson vehicles recently ordered by Pickfords Limited.


INLET VALVE SHROUD
SHOWING PATH OF FUEL SPRAY IN STILL AIR
DIRECTION OF HORIZONTAL AIR STREAM SHOWN BY ARROWS
SHOWING THE EFFECT OF THE ROTARY SWIRL ON THE PATH OF THE FUEL SPRAY
HORIZONTAL AIR STREAM
AIR
FUEL
SHOWING SUPERIMPOSED VERTICAL AIR SWIRL DUE TO AIR BEING TRAPPED BY RISING PISTON
SHOWING EFFECT OF SUPERIMPOSED AIR SWIRL ON THE PATH OF THE FUEL SPRAY

Sketches showing the way in which the air is given the horizontal and vertical swirls to ensure complete combustion of the oil charge in the new Armstrong-Saurer engine

A New Morris-Commercial Type

An addition to the comprehensive range of vehicles made by Morris-Commercial Cars Limited is a short wheelbase, three-ton model designed with two definite objects in view. It is a robust machine, particularly suitable for the carriage of loads which have to be tipped, while it is also well suited for use as a tractor for working with semi-trailers. As an articulated six-wheeler it can deal with loads up to six tons, and as it does not exceed three tons unladen in that form it comes within the scope of the £35 annual Road Fund licence. The position of the driver enables the whole of the engine to be readily accessible, and a new design of front axle renders a useful turning circle possible with the wide lock. There is a very comfortable driver's cab and the equipment includes Trafficators which automatically return to the no-signal position when the steering wheels are straightened after turning a corner.

There is a thermostat to automatically keep the engine at the best temperature to secure economy, while another feature is the Solex thermo-starter carburetter. The new chassis, which also includes progressive springing, is known as CS9/60.

The new Morris-Commercial fitted with a tipping body. It can also be used as the tractor unit with a semi-trailer

Buses for Hyderabad

Some details of a fleet of vehicles recently supplied by British firms for the increase in the road services organised by H.E.H. the Nizam's State Railway

IN the issue of THE RAILWAY GAZETTE for October 26 a review was given of the results of the working of the road services in connection with H.E.H. the Nizam's State Railway and we are now able to supplement those details with some particulars of the latest vehicles purchased in order to extend the services that have proved so successful. These orders include one for eighteen 25-seater buses on Albion Model 43 chassis, with all-metal bodywork by Park Royal Coachworks Limited, and another for six 32-seater buses, on Albion Valkyrie chassis, with all-metal bodywork by the Brush Electrical Engineering Co. Ltd.

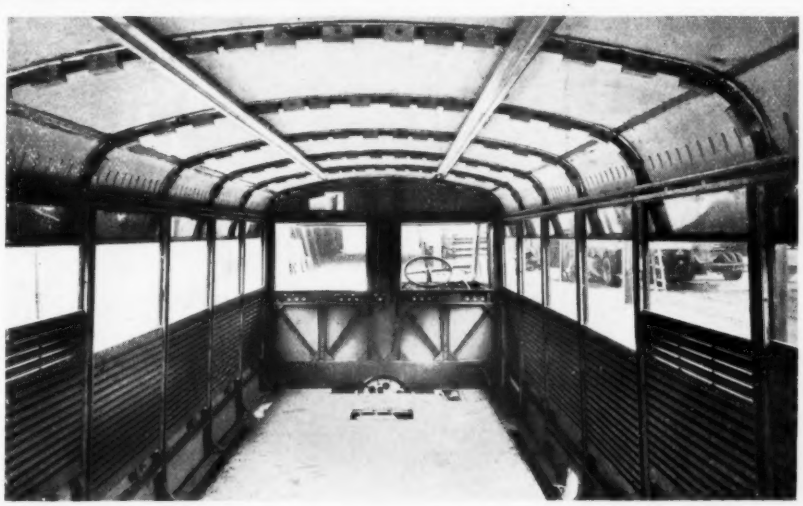
The Brush bodies are built on the sectional assembly principle, the general skeleton being of 30-ton high tensile lipped channel steel bolted up with 60-ton high tensile steel bolts with aluminium alloy castings at all framing joints. The underframe is of welded construction, with a metal floor of aluminium alloy riveted to it, the underside protected from corrosion by a coat of Bitumastic paint with Leyland adhesive tape inserted where the aluminium is in contact with steel. The external panels and outer roof are of aluminium alloy with the inside surface treated with adhesive and sprayed with cork. There are seven drop jalousies on each side. They consist of a one-piece Alpax frame with a Quicktho balancing gear to hold the aluminium louvred slats in any position.

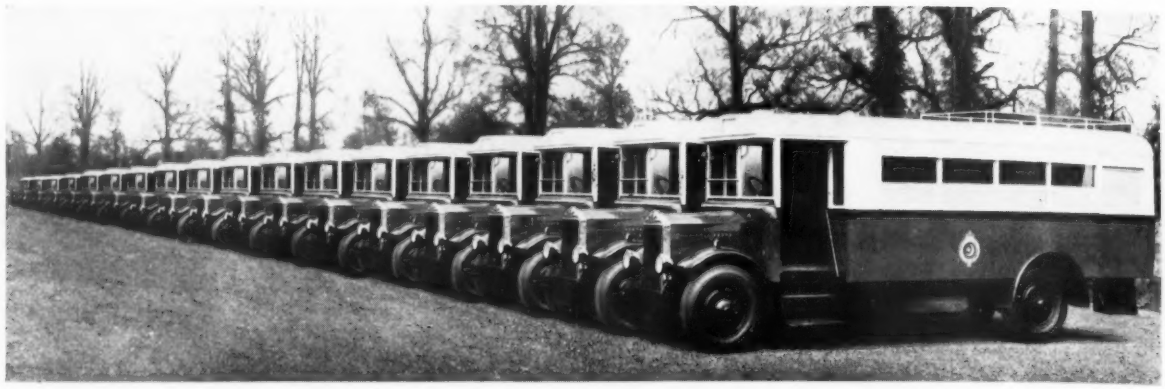
Brush-built buses for H.E.H. the Nizam's State Railway

Above: a view showing the interior of the completed body with the chair frames in position

Centre: a general view of the 32-seater vehicle, bringing out its fine appearance. The chassis is an Albion Valkyrie

Below: a view of the bodywork in the course of construction showing the scheme of panelling and the arrangement of the louvred jalousies, in place of windows





A view of the eighteen Albion vehicles with Park Royal coachwork recently supplied to H.E.H. the Nizam's State Railway for service in and around Hyderabad

The interior is panelled with aluminium sheets and these, together with the mouldings, are covered with scratch-proof Rexine. The ceiling is made of Limpet waterproof sheet, cellulosed cream, and a scheme of ventilation has been arranged to prevent undue heating of the roof. Adequate illumination is provided by the eight lights specially designed to stand out as little as possible from the ceiling. The seat frames are enamelled and the upholstering is to be completed in India.

No door is fitted at the rear entrance, which is on the near side, and the steps consist of Alpax alloy castings with a chequered surface. There is an emergency door on the offside adjacent to the driver's cab and controlled by him. The exterior is painted with Nobel's Belco cellulose, with green panelling below the black waistline, with the upper portion finished in light yellow.

In the Park Royal bodies the framework is also of high tensile steel, with the parts carlotised and coated with pure aluminium primer before assembly. Seven of the side openings are fitted with drop jalousies in Alpax one-piece frame, with aluminium slats, and there is a fixed jalousie on the nearside at the purdah compartment at the rear of the vehicle. There is a doorless entrance at the front of the main saloon with a small protection partition, while at the rear on the nearside there is a coach door giving access to the purdah compartment. This compartment is shielded from the main saloon with a stout waterproof curtain, running on a rod at the top and fixing to seats and floor at the bottom. There is a letter box and conductor's ticket box at the nearside of the dash, and a large metal mail box on the offside at the rear of the driver, with access from the main saloon. The exterior and interior is panelled with aluminium finished in Dulux in the standard colours of the railway. In this case the seats are made up on ashframes, with double caned seats and back rests.

A New Propeller Shaft.—From the Laycock Engineering Company, Victoria Works, Millhouses, Sheffield, we have received a booklet giving details of the Layrub patent propeller shaft which is already being used by a number of well-known vehicle builders. The salient feature of the Layrub propeller shaft is the use of resilient trunnion blocks. The booklet gives some details of the construction of these joints and shows the differences between the various sizes and the stresses they can deal with.

Aluminium Coachwork.—This is the title given to a copiously illustrated booklet just published by the British Aiuminium Co. Ltd., Adelaide House, King William Street, London, E.C.4. It deals with the use of aluminium in the construction of buses, trolley buses, coaches and tramcars and there are illustrations and dimensions of a great many public service vehicles of various types in the service of corporations and other operators all over the country.

One of the latest Leyland Lion chassis with all-metal bodywork. A similar vehicle is being exhibited at the Scottish Show

RAILWAY NEWS SECTION

PERSONAL

Mr. Frank Henderson has resigned the Chairmanship of the Central Uruguay Railway of Monte Video and Associated Lines, on account of ill-health, but retains his seat on the board. Sir Brodie Henderson, K.C.M.G., C.B., has been elected Chairman in his place.

Sir Andrew Duncan, Chairman of the Central Electricity Board, has been appointed Chairman of the Executive Committee of the British Iron and Steel Federation.

INSTITUTE OF TRANSPORT

The following have been elected Corporate and Non-Corporate Members of the Institute during recent months:—

Corporate Members: Messrs. A. E. Hamp, Chief Engineer, Kenya and Uganda Railways and Harbours; J. G. Rose, Technological Chemist, South African Railways and Harbours; J. H. Stanford Smith, Jetty Superintendent (Chittagong), Assam-Bengal Railway; J. B. Stephens, General Manager, Great Northern Railway, Ireland.

Corporate Associate Members: Messrs. A. E. Clark and C. A. V. Johnson, London Transport; G. Faruque, Bengal-Nagpur Railway; F. Foulds, J. Glover, N. Nicholls and R. Whatling, L.M.S.R.; N. E. Gibbs, South African Railways and Harbours; J. L. S. Stoneman, L.N.E.R.; E. A. Toneri and J. R. Turk, Southern Railway.

Non-Corporate Graduates: Messrs. P. D. Anderson, C. R. Brooks, J. T. Butler, H. Freedman, S. J. Gets, J. G. Grove, L. R. Hall, F. G. Heydenrych, H. K. North, T. A. W. Riley, H. L. Smith, H. Smulders, N. Spencer and A. W. Timmerman, South African Railways and Harbours; G. J. Aston, A. E. Blackwell, D. C. Goodacre, G. Goostrey, S. Johnson, H. Parry and C. C. W. Waterman, L.M.S.R.; S. C. Barfield and L. W. Eastwick, Southern Railway; A. R. Brown, L. A. Dennis, E. F. Heus C. L. Newbury, D. Samuel and G. N. Southerden, G.W.R.; R. S. Dixon, G. Lindores, H. H. Mather, J. H. Scott and G. Smeaton, L.N.E.R.; J. E. Miller, Bermuda Railway; L. F. Simpson and M. P. C. Went, Rhodesia Railways; W. A. De Chickera, Ceylon Government Railway.

Non-Corporate Students: Messrs. J. A. Armour, R. A. Bailey, D. W. M. Hammond, W. B. Mann, G. A. Tovey and A. M. Williams, London Transport; P. Barbouch, H. C. W. Boyd, J. J. Brown, R. J. Coates, H. H. P. Fidler, J. P. Hugo and J. J. Van Zyl, South African Railways and Harbours; E. A. Boyes, L.N.E.R.; W. H. Fisher, A. T. L. Reed, G. F. Stoddart, S. Sutcliffe and S. J. Symes, L.M.S.R.; J. P. Fleming, Manchester Ship Canal; E. G. Kotiswaran, G.W.R.; N. L. Waterworth, Rhodesia Railways.

Mr. C. H. Cunliffe, Chief Mechanical Engineer, Nitrate Railways, Chile, has arrived in this country on a short visit.

With regret we note the death, on November 16, of Mr. J. H. S. Dickenson, Metallurgist-in-Chief of the English Steel Corporation, at the age of 52.

The Directors of the Central Argentine Railway announce that owing to pressure of business, Mr. Walter K. Whigham has reluctantly been compelled to resign the Chairmanship of the company, but retains his seat on the board. Mr. W. Howard-Williams has been elected Chairman in his place.

Mr. Howard-Williams, who since May last has been Deputy Chairman of the Central Argentine Railway, began his railway career as a cadet on the London & North Western Railway in 1897. He served his training in the Traffic and Goods Departments, and after varied experience in several districts of the line, was appointed in 1906 Assistant District Goods Manager, South Staffordshire. Four years later he was appointed to a similar position in the Liverpool District. In 1912 he was transferred to Euston as head of the Conciliation Department, and later on became Mineral Traffic Manager. During the war Mr. Howard-Williams acted as Deputy and afterwards Director of Inland Transport of the Ministry of Munitions, being transferred in 1918 to the Board of Trade in order to assist the Coal Controller during the coal crisis, and in the same year he was appointed Assistant General Manager of the London & North Western Railway. He also attended the International Labour Conference at Washington in an advisory capacity to the Employers' Delegate. It was in 1920 that Mr. Howard-Williams went to South America as General Manager of the Central Argentine Railway, from which position he retired in 1926, and then joined the Central Argentine Board in London as a Director. He is also a Director of the Buenos Ayres & Pacific Railway, the Argentine Transandine Railway and the United Railways of Havana.

Mr. W. Howard-Williams, C.B.E.
Elected Chairman, Central Argentine Railway

Sir John Aird, Bart., left estate valued at £466,501 (£457,994 net).

Mr. William Harold Bacon has been elected a Director of the Manchester Ship Canal Company, to fill the vacancy caused by the death of Mr. F. A. Tomlinson.

We regret to record the death, on November 16, of Sir Robert McAlpine, the second baronet, who succeeded his father in the title only a fortnight before that date. The second baronet also was associated with the firm that bears his name.

INDIAN RAILWAY STAFF CHANGES

Mr. H. N. Colam, Agent, M. & S.M.R., returned from leave and resumed charge of his duties on October 26.

The Honourable H. T. de B. Bingham, Senior Government Inspector of Railways, has been granted leave for one year, as from October 11.

Mr. E. B. N. Taylor has been appointed to officiate as Senior Government Inspector of Railways, Circle No. 4, Lahore, as from October 11.

Messrs. J. S. Ramsden and F. Samuelson have been appointed Directors of the British Thomson-Houston Co. Ltd.

BEKONSCOT MODEL RAILWAY.—The Bekonscot model railway village and garden this year produced over £530 for charitable purposes. Of this sum £312 has been given to the Railway Benevolent Institution, £97 to the Church Army, and £121 to general charities.

The Railways in 19—

(*From a correspondent*)

Your old men shall dream dreams,
Your young men shall see visions

To one who in pre-war days travelled week in week out between Liverpool and London and has a vivid recollection of the comfort of the first class diner and the excellent food served therein—including a sound Burgundy at 1s. a pint—the conditions of to-day do not suggest anything very marked in the way of improvement.

Never mind the reason why, that is another story, but if it be the privilege of old men to dream dreams, let one ageing wayfarer try to tell how he sees the trains, the termini and the tuck ten or twenty years hence, when engineers, architects and builders, cooks and caterers, have been given a free hand; when ill-remunerated labour has become the joyous service of free men secure in a National Dividend increasing year by year.

So now for a trip from Euston to Lime Street by one of the Silver Expresses which run every two hours from 6 a.m. to 6 p.m. Let us time it to lunch on the way, and having, by a stroke of good luck, a director of The Amalgamated Transport Service as a travelling companion, we may learn a thing or two during the journey, as well as inwardly digest.

Yes, this is Euston, not the stately pleasure dome Kubla Klan decreed in Xanadu, and yet, "a miracle of rare device," as if designed by one who,

"—on honey-dew hath fed,
And drunk the milk of Paradise."

As a matter of sober fact, it is the work of a young architect commissioned to design and construct to the limit of physical possibility, unhampered by financial considerations.

The approach to the station is a foretaste of the splendour to come. In the centre of what has the appearance of a closely shaven lawn, but is actually a pavement of green rubber blocks over whose resilient surface the heaviest traffic glides without a sound, rises from a marble basin a stately bronze fountain, with Tritons and spiral shells all complete scattering a shower of diamonds on the clear summer air. So quiet it is that one can hear the plash and tinkle of the water. From north to south sweeps an imposing semicircle of Corinthian columns, through which the gilded scroll-work of wrought iron gates twinkles invitingly. Curious to relate, there is not a porter or a uniformed official in sight, but as the two travellers mount the broad, shallow steps leading to the atrium—or booking-hall as it used to be called—a sturdy youth clad in a linen smock courteously proffers his services, respectfully saluting the great man, whom he evidently recognises. "12 o'clock Liverpool, George," says the director, and turning to his companion adds, "My nephew, doing what he calls his 'thank-yous' for the National Dividend. Good lad. His elder brother is Assistant Engineer on the Northern section. His chief, by the way, is father of my gardener."

Before taking our places in the Silver Express, let us attempt a description of the atrium, or temple of travel, as it might well be called. The first thing that would strike an observer of to-day is the absence of advertisements and automatic machines. The age of ballyhoo and bunkum is evidently dead. The noble proportions of the building, combined with the restrained scheme of decoration, a harmony of grey and blue with touches of silver, create an atmosphere of reverence which is emphasised by the lack of hustle on the part of the passengers.

In the spaces between the doorways leading to the various offices and public rooms stand heavy bronze vases filled with the variety of grey-blue *cupressus* known as *Triomphe de Boskoop*. Flanking these are green tubs of delphiniums of every shade from watchet blue to a purple that is nearly black. All these are grown and cared for by the station staff.

But time is nearly up. Our two travellers pass through the stainless steel grille—a gift of the metal-workers of Crewe—and enter that miracle of comfort and safety known the world over as the Silver Express.

Punctually at 1.30 lunch is served, and as an example of what can be done for 1s. 6d. in an age of superabundance rationally financed, the menu is worth reproducing.

Iced Cantaloup Melon
Grilled Sole. Tartar Sauce
Cold York Ham
Salade Rehal: (lettuce, tomatoes, truffles)
Zabaglione
Coffee.

After that the wayfarer and the director adjust chairs to a soporiferous angle and indulge in forty winks.

Paris-Le Havre rapide passing Acheres at full speed, headed by Pacific locomotive No. 231-635D *rebuilt with O.C. poppet valves to L.P. cylinders and improved superheater, steam pipe and exhaust arrangements. Note effectiveness of smoke deflectors. The modernisation of these locomotives was described in our issue of September* 21 (*page* 456)

Freight Rebate Scheme Review

The Railway Rates Tribunal on Monday and Tuesday held a review of the operation of the railway freight rebate scheme pursuant to a certificate issued by the Minister of Transport, on the application of the four amalgamated railway companies. The Minister was of opinion that the present abnormal conditions of trade constituted an exceptional occurrence which might affect the stability of the fund, and that therefore the rates of the rebates to be allowed in respect of the different selected traffics ought to be reviewed. In connection with the review held a year ago the application by the companies for a certificate was supported by the Mining Association of Great Britain, the British Iron and Steel Federation, and the National Farmers' Union, who, however, did not give their support this year. Mr. Walter Monckton, K.C., and Mr. A. Tylor appeared for the railway companies, Mr. T. F. Davis for the National Farmers' Union, Mr. Jacques Abady for the Mining Association, and Mr. M. F. Barnard for the Iron and Steel Federation.

The scales of rebates fixed by the Tribunal for the year ended September 30, 1934, were:—for agricultural selected traffics 16 per cent. of the carriage charges; for coal class selected traffics 1½d. a ton and 36 per cent. of the remainder of the carriage charges; for toll traffic 40 per cent. of the tolls; for other selected traffics 21 per cent. of the carriage charges. The surplus aimed at as the result of these scales was estimated at £778,659, but the surplus actually resulting from the operation of the scheme was £223,000 less, and that actual surplus included £130,000 profits on the sales of investments.

Mr. Monckton, K.C., explained that in the view of the companies a surplus of £775,000 should be aimed at in order to secure the stability of the fund and to avoid the violent fluctuations in rates which would be likely to be caused if too small a surplus were sought for. They proposed for the year ending September 30, 1935, to adjust the existing agricultural 16 per cent. to 13·12 per cent., to adjust the coal class existing 1½d. a ton and 36 per cent. of the remainder to 1½d. a ton and 23·68 per cent. of the remainder, and to adjust the toll of 40 per cent. to, say, 27½ per cent., the existing 21 per cent. for other industrial traffics being adjusted to 10·71 per cent. The companies also asked that the sum to be paid out of the general monies of the fund in respect of administrative expenses should be such a percentage as would yield approximately £43,000.

Mr. W. V. Wood, Vice-President for the Financial Services of the L.M.S.R., gave evidence on behalf of the four companies. He estimated that during the next twelve months the volume of agricultural traffic would remain the same, that of coal for shipment would be 3½ per cent. greater, and that of coal for iron and steel works, and other industrial traffic, would be 10 per cent. greater. If the existing rates of rebate were maintained the stability of the fund would be impaired. It would be possible to round off to convenient figures the percentages which had been proposed for the purpose of securing an estimated surplus of £778,000.

Mr. W. A. Lee, Secretary of the Mining Association, thought that, taking the two classes of coal (shipment and works) together, there would not be any increase on last year's tonnage. Last year he had said it was most desirable that there should be no violent fluctuations in the rate of rebate, but the important thing to-day was that the coal industry should have all the assistance it possibly could from the rebate scheme. Stability was a secondary consideration to-day. The paramount necessity was to enable the industry to live.

Mr. Frederick L. Sabatini, Transport Secretary of the Farmers' Union, giving evidence on Tuesday, forecasted an all-round reduction in the amount of agricultural traffic to be carried by the railways during 1935.

Mr. T. F. Davis, for the Farmers' Union, asked that the Tribunal should not budget for a large surplus. He suggested that agriculture's proportion should be 16⅔ per cent.

Mr. Barnard, for the British Iron and Steel Federation, said the Federation's view was that all the net revenue of the fund should be distributed.

Mr. Jacques Abady, for the Mining Association of Great Britain, said the mining industry was entitled to seven-tenths of the relief to be distributed—a figure of about £2,750,000. He asked that the rebates should be fixed on the basis that the total amount of tonnage to qualify for rebate during the coming year would be approximately the same as that actually carried during the last year.

The hearing concluded and judgment was reserved.

PARLIAMENTARY NOTES

M.P.'s Plea for the "Home of Railway Production"

In course of the two days' debate in the House of Commons on November 14 and 15 on the reports of the Commissioners who inquired into conditions in distressed areas there were several references to railways.

Mr. Curry said another form besides the coal export trade which migration of industry took from time to time was through the process of rationalisation, and they had had a very good illustration of that in the county of Durham over a period of years in the policy of the L.N.E.R., which had decided to concentrate its activities at Darlington. For that purpose work had been transferred from Gateshead to Darlington, and he learned with dismay that it was now proposed to transfer a large portion of the works from Shildon, in his constituency of Bishop Auckland, to Darlington, and there had already been transferred certain families from Bishop Auckland to Darlington. That was the sort of migration which hit a town very hard indeed, because here was a community which was in receipt of regular wages, which, when it was working, had a stability and security of work which was not possible in the mining industry, with its spasmodic employment and greater risks; and he would plead with the Government seriously to use its influence with the L.N.E.R. to vary that policy.

"After all," added Mr. Curry, "Shildon is the home of the production of railways. Shildon is a town which grew up upon railway production—engines and so forth—and there is not a town in the whole of my division the future of which gives greater concern than that town, with its population of 15,000 people. The collieries upon which they lived have already been not merely closed down but dismantled, and if now, on the top of that, you are going to permit of the transference of the railway shops, I tremble to think what will be the future of that once prosperous township. I implore the Government to look at this as a practical thing which they might use their influence to avoid, and which would, I am sure, be appreciated very much in the district."

Electricity Supplies to Railway Companies

The statement in the King's Speech that a Bill will be laid before Parliament to amend the law relating to the supply of electricity refers to the Government measure, the Electricity Supply Bill, which was dropped from the programme of business for last session on Friday, November 16. This Bill, which had passed the House of Lords early this year, proposes to invest the Central Electricity Board with authority to supply electricity direct to railway companies. This involves the amendment of the Electricity (Supply) Act, 1926. When the Bill is re-introduced by the Government in the course of the next few weeks, a number of Unionist members will, on the motion for the second reading, move that it be referred to a Select Committee.

The Machine Tool and Engineering Exhibition

We continue herewith our review of the principal exhibits of railway interest on the stands of manufacturers at the Machine Tool and Engineering Exhibition, Olympia, the first part of which appeared in our issue last week. The exhibition, which closes to-morrow, (Saturday), was visited on Wednesday, November 14, by H.R.H. the Prince of Wales, attended by Major Sir John Aird, Bt. A general view of the exhibits at Olympia appeared on p. 803 of last week's issue. The machines described this week include boring, grinding and polishing equipment, and are arranged in alphabetical order of makers.

Hoffmann Manufacturing Co. Ltd.

The stands of the Hoffmann Manufacturing Co. Ltd., of Chelmsford, Nos. 73B and 75B in the Grand Hall, have been designed to show the influence of anti-friction bearings on the development and behaviour of modern machine tools, and to demonstrate how the precision and reliability of the bearings are reflected in the tool in which they incorporated. The exhibit is divided into two sections, namely (*a*) a comprehensive display of Hoffmann manufactures, and (*b*) a number of machine tools in which these are incorporated. A further item of interest is a ball bouncing device, by means of which it is possible to gauge the absolute uniformity of these products.

John Holroyd & Co. Ltd.

On stand No. 73A in the Grand Hall, John Holroyd & Co. Ltd., of Milnrow, near Rochdale, is showing the firm's latest type worm grinding machine. This embodies the Durand type patent grinding head for which the firm holds the sole licence in Great Britain and the British Empire. There are other exclusive features on this machine, including the Holroyd automatic control system. The machine will be exhibited under working conditions. A further exhibit is one of the firm's 4½ in. × 12 in. screw and worm milling machines, designed for milling the threads of screws and worms within its capacity of square, acme, vee, knuckle, buttress or any other thread. A gear testing machine is also presented for inspection. In addition to the above machines there is a Holroyd latest type woodworkers' tool grinding machine, and a tool honing and bench model packing cutting machine. These three useful tools are manufactured in large quantities and are employed all over the world. A number of photographs of recent productions in the way of up-to-date machine tools for various purposes add to the interest of the exhibit. Samples of various gears cut by the firm, small tools, cutters and samples of holfos and super holfos are also shown.

Imperial Chemical Industries Limited

Imperial Chemical Industries Limited, Millbank, London, S.W.1, is showing on stand No. 115C four models of their metal degreasing plant, which employs trichlorethylene, the most powerful grease solvent known. These machines are used in conjunction with the process which is being successfully applied to plating, polishing, enamelling, rust-proofing and all metal finishing processes; to all classes of repair, renovation and maintenance work. The four plants on view vary in size and equipment. Two of them are gas heated, one electrically heated, and the fourth is gas heated and fitted with flameproof equipment. There is also a display of the Cassel cyanide exhibit of case hardening, and visitors to the exhibition are invited to bring their own samples for treatment to the stand of Imperial Chemical Industries Limited. There is shown in operation a type F6 case hardening furnace, pot size 10½ in. × 15 in. This plant, while occupying only one sq. yd., can turn out 100 lb. of work an hour, heat treated or carburised to a depth of 0·005 in. Visitors to the stand will doubtless be interested in the new deep cementation compound known as Rapideep. This is produced by the Cassel Cyanide Company for use in the ordinary case hardening bath, and its particular purposes are well worth an investigation.

H. W. Kearns & Co. Ltd.

A range of horizontal boring machines of the latest types are exhibited by H. W. Kearns & Co. Ltd., of Manchester, stands 59 and 87, Grand Hall. The Kearns patent high-speed surfacing, boring, milling, drilling and tapping machine, No. 4 size, is of a type supplied to the Great Western Railway for use in the company's Swindon works and incorporates a number of new features. Other exhibits include a Kearns standard No. 2 size high-speed surfacing, boring, milling and drilling machine of robust design, well adapted to all kinds of rough facing work and driven by a 10 h.p. motor. In addition a high-speed light type horizontal boring machine, specially designed for operation at high speeds up to 1,200 r.p.m., is shown. In this case the whole of the transmission is mounted on ball or roller bearings.

Kitchen & Wade Limited

Kitchen & Wade Limited, of Halifax, is exhibiting on stand No. 20 a representative selection of drilling and boring machines, including 8 ft. 0 in. and 6 ft. 0 in. all-electric heavy duty radials and a 5 ft. 0 in. all-electric general purpose radial machine. Further, there are on view 3 ft. 6 in. belt-driven general purpose and 6 ft. 0 in. construction work radial drills and light type sensitive radials in sizes 32 in. and 40 in.

John Lang & Sons Ltd.

John Lang & Sons Ltd., of Johnstone, near Glasgow, is exhibiting a series of lathes applicable to various classes of railway work. These include a 16 in. swing high speed sliding, surfacing and screwcutting lathe which can be used for turning connecting rod big end bolts, pins and other similar items; also a 26 in. swing surfacing and boring lathe for all classes of large bushes, eccentric straps, sheaves and liners. Lang Junior lathes are also being shown of types used for the production of small shafts and smaller sizes of bushes of all types. A tool room lathe shown has a 7 ft. 6 in. bed and is adapted to take 3 ft. 6 in. between centres. An all-geared headstock is fitted, and there are twelve spindle speeds ranging from 10 to 534 r.p.m. The feed and screwcutting gearbox gives 60 changes of feed—7·5 to 456 cuts per in.—and threads including Whitworth, metric, diametral and module without loose change wheels. All shafts are on ball or roller bearings, and all the gears in feed and screwcutting mechanisms have gear teeth profile ground after cutting or heat treatment.

Luke & Spencer Limited

Luke & Spencer Limited, Broadheath, Manchester, is showing on stand 22A in the Grand Hall a series of their grinding and polishing machines. These incorporate a five spindle semi-automatic polishing machine designed for the repetition polishing of all kinds of circular articles. Another item is a hydraulic single heavy duty automatic polishing work head designed for automatically reciprocating deep pressings for either internal or external polishing. The spindle holding the work is arranged with a suitable chuck and revolved continuously. The rate of rotation can be varied according to the diameter of the article being polished. A separate motor drive and variable speed gear is fitted on the slide. The main slide is provided with a hydraulically operated to and fro movement capable of variable speed. A high speed swing frame grinder of new design with an all-steel frame body fitted with two speeds and safety device is another item of interest on the stand. This is a motor driven machine for high speed grinding operations. Of great interest to all production engineers who are particularly concerned in obtaining the maximum benefit from high speed grinding is a Luke & Spencer high speed grinder, the machine being motor driven and fitted with a special gearbox mounted inside carrying a number of speeds, and the handwheel on the front of the machine, which will, in turn through gears and screws, move back the guards at the same time. As this gearing is all positive and interlocked, it will be seen that it is impossible to alter the speed when a wheel is on the machine to

anything higher than that permitted by the movement of the guard surrounding the wheel.

B. & S. Massey Limited

B. & S. Massey Limited, of Manchester, is showing motor driven pneumatic power hammers, with and without slides respectively, in the 3 cwt. and 5 cwt. sizes, a 65 lb. spring power hammer with foot control and a 5 cwt. steam or compressed air, Rigby type hammer. Items of particular interest to railway workshop engineers are the hydraulic tyre fixing rolls for securing the retaining rings of locomotive carriage and wagon wheels, irrespective of gauge. Drop stamps, oil furnaces, a 200 ton trimming press, and a portable planing machine for truing up to anvil blocks and tups in position are also represented by interesting examples.

The Moss Gear Co. Ltd.

The Moss Gear Co. Ltd., of Tyburn, Birmingham, is showing some of the firm's most recent productions in industrial gear units. These include a 125 h.p. 8-in. centres totally enclosed double helical type speed increasing gear unit having a 5:1 ratio at 1,500/2,500 r.p.m. This unit is fitted with oil cooler and oil filler mechanism, lubrication under pressure to bearings and sprayers, and hand pump for starting application. The exhibit includes single, double and triple reduction gear units and others of 6—8 speed geared unit for application to small mechanical stokers or continuous furnace mechanism. This unit is fitted with motor and gear mechanism capable of transmitting ¾ h.p. at 1,850 r.p.m. Examples of single helical, worm and planetary gearing are also shown, together with a full line of mechanical universal joints in sizes suitable for application to the largest or smallest machine tool requirements.

Samuel Osborn & Co. Ltd.

On stand No. 19A in the Grand Hall, Samuel Osborn & Co. Ltd., of Sheffield, is exhibiting this firm's well-known productions, including a range of tools manufactured from high speed steels. By a recent arrangement, the firm is able to offer a complete range of tooling equipment suitable for all kinds of machine shops, varying from tools made of carbon tool steel to the Mushet qualities of high speed steel and S.O.B.V. cutting alloy, together with the latest type of molybdenum Titanium carbide, namely Osborn's Cutanit. The efficiency of lathe tools made from Osborn's Double Mushet high speed steel and the other materials named is demonstrated on a 12½ in. centre sliding, surfacing and screw cutting lathe supplied by John Lang & Sons Ltd., of Johnstone. This is driven by a 35 h.p., 3 phase slipring induction motor, running at 965 r.p.m. supplied by The English Electric Co. Ltd. Three qualities of twist drills are used, and for this purpose a 36 in. box body vertical drilling machine by Wm. Asquith Limited of Halifax is employed. The cutting power of Osborn's milling cutters of three qualities are demonstrated, the machine used being a 28 in. horizontal milling machine by Jas. Archdale & Co. Ltd., of Birmingham, which is being driven by a 10 h.p. motor. In addition to the above there are show cases showing examples of the firm's tools such as files, chisels, drills, reamers, hobs, pneumatic snaps, &c. Osborn's Evershyne and Weldshyne steels in various forms, and test samples of the firm's tropic heat-resisting steel, are also on view. The stand is in charge of practical engineers, whose endeavour it is to assist in solving any tooling problems brought to their notice.

J. Parkinson & Son

On stands 66 and 77 in the Grand Hall, J. Parkinson & Son of Shipley, Yorks, exhibits plain and universal milling machines and the Sunderland gear planer for double helical, spur and spiral gears. The No. 2P plain milling machine is equipped with twin overarms and table movements measuring 30 in. × 10 in. × 18½ in. There are twelve spindle speeds and a corresponding number of feeds. The 3J plain milling machine has a box type sliding overarm and patent offset brace from overarm to knee. In this case the table movements are 40 in. × 12 in. × 18 in. and the machine has sixteen spindle speeds and sixteen feeds. Ball and roller bearings are fitted, and ground gears and automatic lubrication are used in the main transmission. The Sunderland gear planers are shown in two sizes, viz. the No. 16 for spur and spiral gears, and the No. 23 for double helical gears.

Ransome & Marles Bearing Co. Ltd.

Ransome & Marles Bearing Co. Ltd., of Newark-on-Trent, has on stand 72B a comprehensive selection of ball and roller bearings suitable for machine tools, of special interest being the bearings for exceptionally high speed work. These are made to ultra-fine limits of accuracy, and are fitted with specially balanced cages, made either from duralumin or bakelite. Bearings made to this specification are employed on a number of high speed machine tools, including grinding spindles, and in one instance, the bearings are operating at a speed of 70,000 r.p.m. The interest that has been aroused by the more common use of needle roller bearings is also met by a display on this stand of needle rollers and needle roller bearings.

Skefko Ball Bearing Co. Ltd.

The exhibit of the Skefko Ball Bearing Co. Ltd., of Luton, stand 82, Grand Hall, is designed to indicate the firm's very comprehensive range of S.K.F. ball and roller bearings available for all machine and engineering applications. An interesting feature is the display in motion of a group of the well-known S.K.F. ball and roller bearing lineshaft accesssories for power transmission purposes. These are driven solely by the air current created by a diminutive propeller on the shaft of a fractional h.p. electric motor, a convincing proof of the frictionless qualities of S.K.F. bearings. A group of sectioned mechanical parts containing bearings is also on view and a number of instructive photographs and sectional drawings are used to demonstrate various applications and methods of mounting S.K.F. ball and roller bearings. An interesting item consists of a novel centre-piece designed in the form of a miniature arcade and constructed of black bakelite, stainless steel and plate glass. This incorporates several standard products including the S.K.F. deep-groove, single-row ball bearing, taper roller bearings, and single-row cylindrical roller bearings. The S.K.F. self-aligning roller bearing for very severe loading, both radial and thrust, is also shown, together with other types manufactured by the firm. Altogether a most interesting display.

Tecalemit Limited

Tecalemit Limited, of Brentford, occupying stand 154 in the Gallery, is represented on many of the other stands, where examples of the Tecalemit system of grease lubrication are applied to machine tools. This system simplifies and regularises the process of lubricating machine tools by ensuring consistently good work and long life for the many good class machines equipped on this principle. The firm has also done a considerable amount of work in supplying grease lubricating equipment for locomotives.

United Steel Companies Limited

On stand No. 158B the United Steel Companies, Limited, of Sheffield, is exhibiting Phoenix (standardised) rapid machining steel. This supersedes ordinary free cutting steels in that whilst it possesses unsurpassed free cutting properties, it is free from the disadvantages of brittleness and lack of toughness found in free cutting steels. Its physical properties compare favourably with mild steel. Phoenix steel can be machined at speeds up to 400 ft. a minute with a fine silky finish, and cause a minimum of tool wear. To ensure uniformity of production when in the hands of the production engineer, a rigid system of procedure is followed and every stage in the manufacture of the steel is standardised. A certificate is issued with each consignment of Phoenix steel in order that users may be assured that they are buying the genuine article.

C. C. Wakefield & Co. Ltd.

C. C. Wakefield & Co. Ltd., Wakefield House, 30-32, Cheapside, London, E.C.2, has an interesting display on

stand 160B in the Gallery. The firm is showing the Wakefield type C lubricator and the No. 12N pattern sight feed lubricator. In addition there is shown the Wakefield Ayrlyne and the new Wakefield grease lubricator. The type C Wakefield lubricator is a neat and compact instrument that has proved itself extremely popular where mechanical lubrication is required for a large number of individual points. It will accommodate as many as 60 feeds, the length of body being adjusted to take as many feeds as required. It is the smallest lubricator of its type on the market and where multi-feed lubricators are required and space is very limited it can usually be readily fitted. The Wakefield No. 12N pattern mechanical sight-feed lubricator represents the latest improved design of the maker's sight feed lubricator and incorporates several important new features. It is extremely simple in operation and robustly constructed, and each sight glass is capable of withstanding pressures up to 1,000 lb. per sq. in. and gives positive indication of the oil being applied. Each feed can be regulated from zero to maximum. There are no glands subjected to high pressure oil feed and each feed has a separate flushing plunger which operates entirely independently of the pump plunger. Ample space is provided for water in the sight feed fittings, so that clouding of the glass is avoided over long periods. The pump plunger is not driven directly off the eccentric inside the lubricator. Thus side thrust and plunger wear are avoided. The lubricator is, of course, applied not only to steam and internal combustion engines, but can be fitted for various types of industrial machinery where a reliable sight feed lubricator is called for. It is entirely self-contained and can be supplied with from one to twenty feeds.

H. W. Ward & Co. Ltd.

H. W. Ward & Co. Ltd., of Birmingham, stand No. 65, Grand Hall, is showing the latest type No. 3A capstan lathe, arranged with built-in motor drive. This is equipped with suitable tools for producing railway boiler staybolts. The firm is in addition showing its largest type of machine, namely, the No. 16 combination turret lathe with patent covered bed, ball and roller bearings throughout, automatic feeds to both saddles in all directions, automatic lubrication and other features. This machine, without any tooling equipment of any kind, weighs over 10 tons and is admirably suited for use in heavy machine shops of railway works. The No. 13 combination turret lathe is a large and powerful machine designed with a view to the requirements of both the high speed and heavy cutting which tungsten carbide and modern alloy tools will allow. The single pulley all-geared headstock gives 16 speeds in each direction and as all gear shafts and spindle are mounted on ball and roller bearings, an extremely high factor of efficiency is obtained at the cutting point. The spindle has a flanged nose 16 in. in diameter, to which the chucks are directly attached, thus reducing overhang to a minimum. The spindle has a clear bore of 8½ in. diameter, which is accurately machined to 8·75 in. at each end to facilitate the fitting of pilot bushes, &c. The saddle has automatic sliding, surfacing and screwcutting motions.

Webster & Bennett Limited

On stand 52, Grand Hall, Webster & Bennett Limited, of Foleshill, Coventry, shows some vertical boring and turning mills. These include a heavy duty centralised control, single mill having the following dimensions:—48 in. diam. chuck, 52 in. diam. swing, 24 in. under cross slide and 35 in. under turret. The column is offset with the base but forms one casting. The heavy slides have integral retaining locks, and the forged steel turret has a special clamping arrangement. Clutch and speed changes are interlocked. This machine is available in sizes from 30-in. to 60-in. What may be described as a boring mill de luxe is the 36-in. (also 48-in.) Maxipower single mill, which includes such advanced features as flanged motor drive, speedbox in column, speedbox and spindle drive shafts with solid splines and Timken roller bearings, Timken bearings to take mitre thrust, and self-indicating dial control to speed and feed boxes. Feeds can be changed while the chuck is revolving at any speed. Automatic flood lubrication to main bearings and gears, and a separate motor for rapid traverse, are also incorporated. A rapid production mill of lighter design but with rather higher chuck speeds and suitable for using alloy tipped tools on a lighter class of work, and a vertical turret lathe with cross slide suitable for tall work, or work requiring a large number of tool stations, may also be seen here.

Railways and the Coal Industry

The community of interest between the railways and the coal industry was stressed by Mr. W. R. Gordon, Director of the Coal Utilisation Council, at a meeting of the G.W.R. Lecture and Debating Society, held at Paddington station on November 15, under the chairmanship of Mr. Raymond Carpmael, Chief Engineer, Great Western Railway. Mr. Gordon's subject was: "Making the Best Use of the Nation's Coal."

He said the railways and the coal industry were mutual customers on a very large scale, and the railway companies undoubtedly had much to gain from an increasing use of coal and coal derivatives for domestic and industrial heating. It was for this purpose of stimulating the use of coal in the home market that the Coal Utilisation Council was established two years ago. As a result of a careful survey of the position in regard to the sale and use of coal in this country, made after the council's inception, its activities were focussed in the following directions: (*a*) propaganda, (*b*) technical service, and (*c*) some measure of coal trade reorganisation. The council's publicity was planned to assist the merchant to increase his sales, and comprised showcards, press advertising, and literature of various kinds. In the matter of technical service, the council's engineers were out to assist coal users to get the maximum of satisfaction from their coal burning plant, and to endeavour to induce conversions to coal from other forms of heating, and see that in new domestic and industrial buildings the case for heating by coal or coal products received full consideration. In the matter of marine fuel he was glad to see some measure of reversion to coal on the part of the Great Western, London Midland & Scottish, and Southern Railways. On the other hand, the Coal Utilisation Council viewed with concern the experimental use by railway companies of diesel and diesel-electric locomotives. In view of the national importance of coal, it was hoped that the true economics of steam operation would be sought, and due regard paid to lower capital cost and maintenance. Mr. Gordon spoke of the need for the use of the best possible devices for preventing breakage of coal in shipment, especially as certain kinds of British coal were somewhat friable. He also made the point that foreign shipping found our trimming charges in connection with bunkering facilities at British ports extremely complicated.

The speaker said that the use of up-to-date plant was an important feature in the avoidance of retrogression in the use of coal. The ideal was the perfect marriage of the fuel and the appliance. A minor hope which he expressed was that the railway station waiting room fire would soon be made a better advertisement for both the railway companies and the coal industry than it was as a rule to-day.

On the subject of coal trade reorganisation, Mr. Gordon said the present system, with its multiplicity of owners, agents and merchants, was uneconomic, and handicapped the industry in its efforts to retain and recapture business. From the railway point of view, the cost of extra shunting and siding occupation entailed by small wagons in such a wide range of ownership must be very considerable. He cordially approved the encouragement given by the Great Western Railway to the use of 20-ton wagons.

RAILWAY AND OTHER MEETINGS

CENTRAL URUGUAY RAILWAY COMPANY OF MONTE VIDEO LIMITED

The ordinary general meeting of the Central Uruguay Railway Company of Monte Video Limited was held at River Plate House, Finsbury Circus, E.C.2, on Monday, November 19. Mr. Frank Henderson having resigned the chairmanship on medical advice, although retaining his place on the board, Sir Brodie Henderson, K.C.M.G., C.B., was elected his successor, and presided over the proceedings. In moving the election of the new Chairman, Sir Follett Holt, K.B.E., referred to Mr. Frank Henderson's record as Chairman of the company for 26 years. "No man in the City of London," he said, "has a wider knowledge of the railway or of Uruguay. He has been, and is, devoted to your interests, and all who have worked under his leadership are devoted to him and will trust that we shall have his advice and help for many years to come."

In moving the adoption of the report and accounts, the Chairman read the speech which had been prepared by his predecessor. Although gross receipts in Uruguayan currency were fractionally higher than in the preceding year, working expenses had unavoidably increased by 3 per cent. The resulting net profit of $1,372,000 meant a decline in sterling of £4,444, or 2·12 per cent. No contribution had been made to Renewal Fund for three years, and it was almost certain that further outlay would be required on track and other equipment.

Economy in maintenance was being studied assiduously. Motor transport had been adopted for permanent way gangs, making possible a reorganisation whereby less men could be used to look after longer sections, but the Chairman was afraid that the essential work would outweigh the savings.

Passenger traffic was the only class to show no increase in sterling receipts, and was causing much anxiety. The number of travellers carried by rail decreased annually, while those going by road became more numerous. The company was not well equipped to offer effective opposition, either by competitive fares or, generally speaking, better times of transit. Light traffic and the need for economy had led to the running of more mixed trains, with consequently slower journeys. The only means of regaining a share of passenger traffic was felt to be the introduction of comparatively fast-running diesel railcars, a subject which was being seriously studied. Road competition for goods had been to some extent held in check, the tonnage carried having risen by 91,000, but at lowered rates.

The moratorium of one year upon the payment of 50 per cent. of the rent charges and debenture interest had been extended by the Committee of Stockholders to September 30, 1935, but the position regarding the remittance of funds had so far failed to improve. The Chairman felt that very difficult times lay nearly ahead of the company, but he saw no reason why, given wise government, the peso should not approach something like its former value. He hoped that conditions during the period of transition would not be sufficiently onerous to drive the company out of business, and that Uruguay would recognise the value of the railways to the nation.

It was earnestly to be hoped that the Uruguayan trade delegation now in London would conclude a satisfactory agreement with the British Government. The Government of Uruguay had reduced its debt to the company on Freight Account to the reasonable figure of £23,000. Renewal Fund was at a very low ebb, with the probability of the small credit balance disappearing entirely by next year. As to the future, the General Manager's cable foresaw better prospects for Brazilian traffic and improved passenger movement due to lower rates.

The report and accounts were adopted unanimously.

At the close of the proceedings, the Chairman presided at the general meetings of the Central Uruguay Northern Extension Railway Co. Ltd., and the Central Uruguay Eastern Extension Railway Limited, the reports and accounts of which were unanimously adopted.

ARGENTINE GREAT WESTERN RAILWAY CO. LTD.

The ordinary general meeting of the Argentine Great Western Railway Co. Ltd. was held at Winchester House, Old Broad Street, E.C., on November 20. The Chairman, the Rt. Hon. Viscount St. Davids, was unable to preside owing to a severe cold, and his place was taken by the Hon. Sir Arthur Stanley, who read from the Chairman's notes.

The notice convening the meeting and the report of the auditors were read by the Secretary (Mr. J. T. Dillon).

In moving the adoption of the report and accounts, the Chairman said that it was not necessary to make a very long speech, as the proceedings which took place at the meeting of the Buenos Ayres & Pacific Railway and been circulated to every stockholder of the Argentine Great Western.

Reviewing the financial position, the Chairman said that the first debenture had been paid. There was consolation of a sort in the fact that the second debenture, and something on the 5 per cent. debentures, had been earned, but unfortunately there was difficulty in getting the money remitted, so that it was not available for the payment of any interest on this side. The Stockholders' Committee had exercised its power of extending the moratorium which came to an end in November until June 30, 1935, and he expressed the gratitude of the company to the members of that body for the help they had afforded and the attention they had given to a thankless task.

The washaway of the Argentine Transandine Railway in January, following the bursting of a natural dam formed by a glacier, had been of serious import to the company. Some idea of the volume of water released could be gained from the fact that a bridge spanning a gorge at a height of fifty or sixty feet was swept away. A debt of gratitude was owed to the staff and management for their energy in establishing rail and road transport through to Chile after the disaster.

Passenger traffic on the Argentine Great Western had fallen off, due to road competition, but goods traffic was slightly up, following an improvement last year. Progress was very slow, but it was apparent. The most satisfactory feature of traffic had been wine, of which 485,000 tons were carried, an increase of 93,000 tons on the preceding year. Fresh fruit reached the record figure of 123,000 tons. Fifteen years ago only 50,000 tons of this commodity were transported. Raisins and dried fruit reached a tonnage of 8,876. This traffic had more than doubled. The railway gave it every facility in the shape of pre-cooling plants and refrigerator wagons. An industry which was greatly increasing was the canning of vegetables.

"The real difficulty of the whole situation," said the Chairman, "lies in the exchange. We have earned money out there, but we can't get it over. What is a profit over there is turned into a loss here." He showed that although the Buenos Ayres & Pacific system had earned total receipts of 66,085,000 Argentine paper dollars in 1934, against 65,600,000 in 1933, this actually represented a decrease by the time the money reached London. The losses of seven important Argentine railways had increased from £1,300,000 in 1933 to £4,200,000 this year. "The railways are earning money, but, alas! not in British currency," the Chairman concluded.

Summing up the prospects for the coming year, he said that vineyards and fruit trees were looking very well. The optimistic tone of speeches at other meetings of British-owned Argentine railways, and other indications, seemed to show that Argentina was slowly progressing.

The report and accounts were unanimously adopted.

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table of freight and passenger traffic figures for August, 1934, as compared with the corresponding period in 1933, compiled from the Ministry of Transport Statement No. 177

Description	Great Britain*	Great Western	London & North Eastern	London Midland & Scottish	Southern
PASSENGER TRAIN TRAFFIC—					
Number of passenger journeys (excluding season-ticket holders)	114,583,412	10,588,110	20,016,652	29,761,169	20,623,241
Increase (+) or decrease (−)	+ 3,609,304	− 75,608	− 51,778	+ 689,067	+ 624,088
Passenger receipts (excluding season-ticket holders)	£7,210,386	£1,100,792	£1,529,153	£2,500,789	£1,496,991
Increase (+) or decrease (−)	+ £265,482	+ £16,449	+ £63,002	+ £91,347	+ £58,470
Season-ticket receipts	£753,159	£47,125	£146,485	£221,071	£230,666
Increase (+) or decrease (−)	+ £18,482	+ £2,255	+ £3,126	− £1,457	+ £8,267
Parcels and miscellaneous traffic receipts (excluding parcels post)	£1,090,613	£197,126	£326,010	£401,790	£144,413
Increase (+) or decrease (−)	− £15,961	− £4,322	+ £4,947	− £10,138	+ £2,087
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	20,647,984	5,078,921	9,134,393	9,520,473	1,336,710
Increase (+) or decrease (−)	+ 1,700,738	+ 359,181	+ 782,354	+ 820,516	+ 50,293
Net ton-miles (excluding free-hauled)	1,170,343,367	218,434,615	391,420 079	472,672,533	56,193,152
Increase (+) or decrease (−)	+ 79,067,853	+ 14,380,035	+ 28,542,482	+ 32,822,536	+ 1,078,908
Average length of haul (miles) (excluding free-hauled)	56·68	43·01	42·85	49·65	42·04
Increase (+) or decrease (−)	− 0·92	− 0·22	− 0·60	− 0·91	0·80
Freight traffic receipts	£6,530,878	£1,141,000	£2,121,000	£2,668,000	£394,620
Increase (+) or decrease (−)	+ £375,019	+ £73,000	+ £133,000	+ £143,000	+ £15,865
Receipts per ton-mile	1·339d.	1·25d.	1·30d.	1·36d.	1·69d.
Increase (+) or decrease (−)	− 0·015d.	—	− 0·02d.	− 0·02d.	+ 0·04d.
Freight train-loads—					
Average train-load (tons)	123·69	132·70	128·29	120·66	105·51
Increase (+) or decrease (−)	+ 2·72	+ 3·85	+ 2·30	+ 2·45	− 0·17
Net ton-miles—					
Per train engine-hour	1,003·89	1,079·08	1,032·75	985·14	840·50
Increase (+) or decrease (−)	− 4·06	+ 16·63	− 8·06	− 16·06	+ 2·62
Per shunting-hour	858·85	784·21	920·41	909·23	582·64
Per total engine-hour	462·86	454·16	486·67	472·83	344·10
Net ton-miles per route-mile per working day	2,568	2,566	2,725	3,001	1,177
Increase (+) or decrease (−)	+ 174	+ 168	+ 200	+ 207	+ 31
Wagon-miles. Total	345,509,952	61,387,488	119,583,836	144,367,673	17,878,559
Increase (+) or decrease (−)	+ 16,450,375	+ 2,166,374	+ 6,236,946	+ 7,624,895	+ 298,700
Percentage of loaded to total	67·13	69·10	64·27	68·79	66·57
Wagons per train—					
Total	34·33	34·45	34·94	34·28	31·81
Increase (+) or decrease (−)	+ 0·05	− 0·06	− 0·10	+ 0·27	− 0·48
Loaded	23·04	23·80	22·46	23·58	21·18
Empty	11·29	10·65	12·48	10·70	10·63
Train-miles. Coaching—					
Per train-hour	15·25	14·25	14·50	14·77	17·45
Per engine-hour	12·01	11·25	11·18	11·08	14·01
Train-miles. Freight—					
Per train-hour	9·52	9·81	9·38	9·53	9·74
Per engine-hour	3·74	3·44	3·84	3·91	3·21
Engine miles. Total	48,383,795	7,525,127	13,342,458	18,043,064	6,550,326
Increase (+) or decrease (−)	+ 1,818,317	+ 218,051	+ 635,283	+ 852,415	+ 90,492
Mileage run by engines. Total train-miles —					
Coaching	25,280,382	3,439,488	5,954,241	8,386,825	4,814,424
Freight	10,065,621	1,782,177	3,422,360	4,210,981	562,028
Engine-hours in traffic. Total	4,993,778	846,689	1,490,702	1,919,196	537,461
Increase (+) or decrease (−)	+ 216,985	+ 21,539	+ 77,671	+ 103,692	+ 12,871
Shunting miles per 100 train-miles—					
Coaching	7·23	6·69	6·43	7·95	7·69
Freight	72·00	84·32	68·52	65·90	95·09

* All standard-gauge railways

Passenger Traffic Statistics: Number of Journeys, Receipts, and receipts per journey (excluding Season-Ticket Holders)—August, 1934

Subject.	Great Britain	Great Western	London & North Eastern	London Midland & Scottish	Southern	Cheshire Lines Committee	Liverpool Overhead	London Passenger Transport Board†	Mersey
Full fares—									
Passenger journeys	29,057,756	925,895	1,403,488	1,937,722	3,133,147	27,038	156,505	20,481,971	94,035
Gross receipts	£1,114,895	£121,203	£178,578	£194,130	£296,699	£3,711	£1,692	£296,787	£1,744
Receipts per passenger journey	9·21d.	31·42d.	30·54d.	24·04d.	22·73d.	32·94d.	2·59d.	3·48d.	4·45d.
Reduced fares—									
Excursion and week-end—									
Passenger journeys	56,844,246	7,264,214	13,859,127	20,344,743	11,403,302	562,084	244,266	1,270,146	636,148
Gross receipts	£5,265,665	£865,837	£1,181,593	£2,071,481	£981,819	£54,742	£2,691	£32,570	£10,678
Receipts per passenger journey	22·23d.	28·61d.	20·46d.	24·44d.	20·66d.	23·37d.	2·64d.	6·15d.	4·03d.
Workmen—									
Passenger journeys	22,832,748	1,608,479	3,077,913	5,942,781	4,897,466	219,792	168,102	5,932,418	170,700
Gross receipts	£331,129	£23,771	£49,502	£95,334	£81,009	£3,915	£1,358	£64,895	£1,569
Receipts per passenger journey	3·48d.	3·55d.	3·86d.	3·85d.	3·97d.	4·27d.	1·94d.	2·63d.	2·21d.
Other descriptions—									
Passenger journeys	5,769,342	770,380	1,648.648	1,508,091	1,184,944	72,442	2,298	425,112	19,953
Gross receipts	£408,899	£65,663	£95,736	£104,085	£132,069	£3,174	£14	£3,756	£249
Receipts per passenger journey	17·01d.	20·46d.	13·94d.	16·56d.	26·75d.	10·52d.	1·46d.	2·12d.	3·00d.
Total—									
Passenger journeys	114,583,412	10,588,110	20,016,652	29,761,169	20,623,241	881,590	571,171	28,109,647	920,836
Gross receipts	£7,210,386	£1,100,792	£1,529,153	£2,500,789	£1,496,991	£65,783	£5,755	£398,008	£14,240
Receipts per passenger journey	15·10d.	24·95d.	18·33d.	20·17d.	17·42d.	17·91d.	2·42d.	3·40d.	3·71d.

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

NOTES AND NEWS

Institute of Transport Annual Dinner.—The annual dinner of the Institute of Transport, under the Presidency of Mr. Sidney E. Garcke, will be held at the Connaught Rooms, London, on Friday, February 15, 1935.

137 Miles for 3 Shillings.—On Saturday, December 8, an L.N.E.R. express excursion train will leave Ipswich at 5.20 p.m. for Liverpool Street, arriving at 6.55 and returning at 11.55 p.m.; the fare for this journey of 137½ miles will be 3s. The train will call only at Colchester, and the fare from that station will be 2s. 6d. for a journey of 103½ miles.

Puerto Cabello & Valencia Railway.—Holders of the 5 per cent. first charge bonds of the Puerto Cabello & Valencia Railway Co. Ltd., at a meeting on November 15, agreed to an extension of the former moratorium (which provided for the postponement of interest payments from July 1, 1932, to December 31, 1934), for a further period of three years, until December 31, 1937, but subject to the condition that so far as the profits of the railway were available that amount should be paid *ad interim*.

Chinese Government Mission.—A Chinese Government Mission is visiting this country to study British railway organisation. The members were received on Friday last by Mr. G. Cole Deacon, Secretary of the Railway Companies' Association, when plans for their introduction to the various branches of railway operation were discussed. On the previous day they visited Mr. Hore-Belisha, Minister of Transport. The mission, headed by Mr. Yu Fei Peng, Chinese Vice-Minister of Communications, comprises three representatives of the Chinese Ministry of Communications (Mr. Efy Wei, Chief Technical Expert; Mr. P. F. Woo, Technical Expert; and M. H. C. Loh, Secretary) and Mr. H. Chen, Mechanical Engineer to the Chinese Ministry of Railways.

Railway Engineering at Eton.—On Friday, November 16, a lecture entitled "Some Feats of Railway Engineering" was given by Mr. Cecil J. Allen to the First Hundred at Eton College. The lecturer, who was introduced by the Headmaster, Mr. C. A. Elliott, dealt first with the general principles governing railway location, and then in detail with certain notable railway routes, such as the main line of the Canadian Pacific Railway through the Rockies, the Lötschberg Railway in Switzerland, and others. Questions of track and loading gauges were then discussed, with references to Brunel's 7-ft. gauge, and to other variations of gauge from 15 in. upwards, as well as to the effect on rolling stock design of the differences between British and American loading gauges. The lecture concluded with descriptions of some of the world's most notable railway bridge structures, in masonry, reinforced concrete, and steel. It was illustrated with a series of lantern slides, one particularly striking set showing the course of construction of Sydney Harbour Bridge.

Railway Benevolent Institution.—The 77th anniversary festival of the Railway Benevolent Institution will be held in the Connaught Rooms, Great Queen Street, London, W.C.2, on Tuesday, April 2, 1935, when the Rt. Hon. Lord Wakehurst, Chairman of the Southern Railway Company, President of the Institution for 1935, will preside. We understand that on this occasion the dinner will be followed by a dance.

Payments on Chinese Railway Loans.—Notice is given that Coupon No. 60 of the Shanghai-Nanking Railway 5 per cent. Gold Railway Loan due June 1, 1933, and Coupon No. 53 of the Shanghai-Hangchow-Ningpo Railway 5 per cent. Loan, due December 1, 1934, will be paid on and after December 1 (subsequent Saturdays excepted) at the Hongkong & Shanghai Banking Corporation, 9, Gracechurch Street, E.C.3, and must be lodged three clear days for examination previous to payment.

Fatalities in American Train Accidents.—The Interstate Commerce Commission final record of railway accidents in the United States during 1933 shows that the total number of passengers fatally injured in train accidents during the year was twenty-five. In 1932 the total was three. The average annual fatalities from 1922 to 1926 were seventy-seven, after which they fluctuated from ten in 1927 and sixteen in 1928, to thirty-six in the pre-depression year, 1929. Subsequent declines were to seven in 1930 and four in 1931.

Kenya Railway Rates and Finance.—Mr. Parkinson asked the Secretary of State for the Colonies on Wednesday, November 14, whether he could now state what action had been taken to give effect to the suggestions made by Mr. Roger Gibb in his Report on railway rates finance in Kenya; and, in particular, whether it was proposed, in accordance with his recommendations, to abolish the post of high commissioner of transport, to alter the constitution of the railway advisory council, and to appoint a small board in London similar to the board of the Nyasaland Railway. In his reply, Sir Philip Cunliffe-Lister said "The Gibb report has received very careful consideration in the three territories and by the Governors in Conference. I have received their considered opinions and I hope shortly to be able to state the conclusions reached on the main suggestions. I think this will be most conveniently done by means of a despatch which I will publish. As regards the second part of the question, I have found that local opinion is strongly opposed to transferring the responsibility of the railway to a London Board, and after full consideration I have come to the conclusion that Mr. Gibb's proposals in this regard are not practicable."

Cheap Rail Travel in Germany.—The German State Railway Company has announced in London that there will be a reduction of 60 per cent. in fares for all visitors from abroad, provided they spend at least seven full days in Germany, from December 21 next until March 17, 1935; at Easter 1935, from April 13 to April 29; and for the summer season, June 1 to October 31.

Sleeping and Dining Cars for West Africa.—The French colonial authorities are proposing to introduce sleeping and dining car services on the Dakar-Niger lines, and to that end the International Sleeping Car Company has been approached regarding the provision of suitable vehicles. It is also proposed to fit all the goods rolling stock on the Senegal and Ivory Coast lines with continuous brakes, and this work is to commence next year.

L.M.S. Shopmen.—Whether the London Midland & Scottish Railway had the right to alter the basis of employment of certain railway shopmen at Derby from piecework to timework was a question raised by the National Union of Railwaymen before the Industrial Court. The men had been transferred from the carriage and wagon department to the civil engineer's department. The Court, in its award, issued on November 16, stated that the company was not precluded by the terms of a previous award from taking the action it had done.

Conference for Medical Officers in Industry Overseas.—It has been felt for some time that sufficient opportunity has not been given to medical officers in industry overseas to exchange views on the various problems peculiar to their particular industries and to the areas where they are practising. It is proposed to hold at the London School of Hygiene and Tropical Medicine an annual conference, lasting for two days, in order that medical officers in industry on leave from the tropics may be able to meet their collcagues and discuss their problems. The main subject for discussion will be the prevention of disease, *e.g.*, control of malaria and epidemic diseases in the tropics; water supplies; sewage and refuse disposal; housing; the keeping of records; and hygiene generally. All medical officers practising on railways, plantations, mines, hydro-electric and construction schemes and development companies generally will be welcomed. The conference each year will be held in July, and medical officers who would like to

attend are invited to apply to the Organising Secretary, Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.

Sussex Station Renamed.—The Southern Railway has renamed Waldron and Horeham Road station as Waldron and Horam.

Lancashire Station Renamed.—The L.M.S.R. has renamed Hutton and Howick station (Lancs), on the Southport-Preston line, as New Longton and Hutton.

Birmingham May Run Municipal Air Service.—The city of Birmingham is applying to Parliament for powers to own and operate aircraft for the conveyance of passengers and goods traffic. The city may thus become the first in England to operate a municipal air service. A large municipal airport some seven miles from the centre of the city is being rapidly completed.

Flying Scotsman Passengers to Hear Royal Wedding Broadcast.—By permission of the B.B.C. the L.N.E.R. has made arrangements with McMichael Radio Limited for the broadcast of the Royal Wedding on November 29 to be made available for passengers travelling in the Flying Scotsman express trains. Portable wireless sets are to be installed in the first and third class restaurant cars with amplifiers so arranged as to ensure equality of reception throughout the cars. No additional charge will be made to passengers for this facility.

The Mozambique Convention.—A cablegram received from our own correspondent in South Africa states that the railway proposals, upon which the last negotiations broke down—as reported in THE RAILWAY GAZETTE of September 14—are being reconsidered and revised. The Union Government has now undertaken to guarantee to Lourenço Marques 47½ per cent. of the total tonnage of commercial seaborne goods traffic (excluding Government traffic) imported into the competitive area bounded by lines drawn between goods depots serving Pretoria, Springs, Vereeniging, Klerksdorp, Welverdiend, and Krugersdorp. The result of this amendment is expected to be a substantial reduction in the railway rates to the Rand from Durban and East London.

Smyrna-Cassaba and Extensions Railway Company.—The Turkish Government has taken over as from March last the concession for the railways of 700 km. on the standard gauge previously held by this company. In connection with this purchase it is announced that the optional exchange of the bonds of the 4½ per cent. 1894, 4 per cent. 1895 and funding 5 per cent. issues of the company for bonds of the Turkish 7½ per cent. 1934 (second charge) will take place in Paris for a period of three months as from November 1, 1934. British holders can obtain further information relating to this exchange from the Ottoman Bank, Coupon Department, 123, Old Broad Street, E.C. Coupon No. 1 of the Turkish 7½ per cent. 1934 bonds (second charge), due on November 25, will be payable on and after that date at the Ottoman Bank, Istanbul, Paris, and London. The company's bonds were issued in France.

Air Conditioning on American Railways.—Railways in the western territory intend to spend over $12,000,000 on air conditioning in order to attract passengers next summer, according to Reuters. Some 1,200 cars of a quota of 2,500 will be air conditioned, of which 700 will be Pullmans and 500 ordinary coaches. Nearly all the western and south western railways will participate in the general improvement.

The Future of the Internal Air Mail.—In announcing a forthcoming wide extension of air mail facilities in the United Kingdom last week, the Postmaster-General stated that an agreehad been reached with Hillman's Airways Limited for the conveyance of letters daily in both directions between London, Liverpool, Belfast, and Glasgow, as from December 1 next. Railway Air Services Limited, which has carried the mails regularly on this route since August 20 last, failed to retain the contract when it was thrown open to tender on account of being underquoted. Hillman Airways has yet to prove that it can provide as efficient service as that now being given by Railway Air Services.

Report of the Indian Joint Select Committee.—The report of the Joint Select Committee on Indian Constitutional Reform, which was published on November 21, contains the proposal that, subject to the general control over the policy by the Federal Legislature and Government, control over the future administration of Indian railways should be vested in a Statutory Railway Authority working on business principles. The report also recommends the separation of Burma from India, which will affect the status of the Burma Railways. The former question was dealt with at some length editorially in our issue of just a year ago, November 24, 1933, and the future of the Burma Railways was also similarly discussed in an editorial in our issue of January 19 last.

Dorman Long Capital Reconstruction.—The revised capital reconstruction scheme of Dorman Long & Co. Ltd. was approved on November 21, at separate meetings of debenture holders, and at an extraordinary general meeting which followed the separate meetings. The scheme involves the writing down of the share capital from £11,248,146 to £2,007,271. Preference shares are to be written down from £1 to 15s., and converted into 8 per cent. non-cumulative second preference shares, and arrears of dividend are to be cancelled. Holders of the £5,135,944 of 5½ per cent. debenture stock will receive in exchange 60 per cent. in 5 per cent. debenture stock and 50 per cent. in 6½ per cent. non-cumulative first preference shares. Last year's scheme, which was not approved, would have involved the writing-down of the capital to £1,750,678.

G.W.R. Arts and Crafts Exhibition.—Over 600 entries, a record number, were received for the eighth annual Great Western Railway Arts and Crafts Exhibition, which is being held at Paddington from November 19 to 24. The exhibition includes classes for models, art needlework, wood carving, photography, leather, basket, raffia handiwork, and miscellaneous handiworks. It was open from 3.0 p.m. to 9.0 p.m. on Monday, November 19, and from 11.0 a.m. to 9.0 p.m. on the succeeding dates. The principal awards will be presented by Sir Robert Horne, Chairman, Great Western Railway, today, Friday.

L.M.S. Preference Stocks.—It is considered probable that the directors of the London Midland & Scottish Railway Company will make an announcement on Thursday, November 29, regarding the dividend on the £9,500,000 of 5 per cent. redeemable preference stock (1955). This dividend is properly payable on January 1, but the stock ranks *pari passu* with the £118,000,000 odd of 4 per cent. preference stock on which the dividend is payable at the end of February or beginning of March. For the past two years the directors have deferred their decision on the 5 per cent. stock until the full results of the year were available.

The Week's Road Accidents.—The Ministry of Transport return for the week ended November 17 of persons killed or injured in road accidents is as follows:—

	Killed	Deaths resulting from previous accidents	Injured
England	83 (98)	36 (25)	3,400 (3,614)
Wales ...	5 (5)	— (—)	143 (138)
Scotland	12 (13)	4 (2)	352 (379)
	100 (116)	40 (27)	3,895 (4,131)

The total fatalities of the week, as the result of road accidents, were therefore, 140, as compared with 143 for the previous week.

Temiskaming & Northern Ontario Railway.—The special Commission appointed by the Liberal Government of Ontario to investigate the operation by the previous Ministry of the Temiskaming & Northern Ontario Railway—which is owned and operated by the Ontario Government, and runs between North Bay and James Bay, serving a rich mining region—has now issued its findings. Reference to this inquiry was made on page 389 of THE RAILWAY GAZETTE, of September 7, 1934. Drastic economies, estimated to total $507,613 annually, a complete reorganisation of the system and many changes in personnel are recommended by the report. Amongst the recommendations are that the members of the commission controlling the railway should serve without payment, that a general manager (not a member of the

commission) be appointed, that a chartered accountant be employed as treasurer and chief accountant, that the services of certain officers and employees be dispensed with, that the chairman (Mr. George Lee) be retired with pension, and that a freight soliciting department be established with Mr. Lee considered as head at a salary not exceeding $2,500 a year, that all passes be cancelled as from November 1, except those allowed by the Dominion Railway Board, and that all contracts be awarded only after tenders have been properly called for. The report finds that the Abitibi-Moosonee extension was not justified, that the engineering department was peculiarly lax in preparing specifications for tenders, that the commissioners did not know the exact financial position of the railway, that the actual deficit as at October 31, 1933, was $9,018,211, and that there was general overstaffing. It is announced that the railway will be operated temporarily by a commission of five members headed by Premier Mitchell Hepburn, who will serve without pay pending reorganisation of the staff. The other members of the commission are Messrs. Armand Racine, Arthur G. Slaght and Charles Gallagher, and Colonel Malcolm Lang. The Premier and Mr. Slaght will resign as soon as reorganisation is completed. The chief problem is to find a general manager to succeed Mr. George Lee, former Chairman of the Commission and General Manager.

L.N.E.R. Musical Society.—The society's annual performance of carols will take place in the Queen's Hall, London, on Saturday, December 15. The society's full symphony orchestra of 100 will take part, as will also the male voice choirs, numbering some 400, drawn from the L.N.E.R. service at Cambridge, Doncaster, Grimsby, Ipswich, Lincoln, London, Norwich, Peterborough, York and other places served by the company. All grades of the service will be represented; the soloist will be May Blyth, and a small choir of selected boy choristers from the London Choir School will take suitable parts in the singing of the carols.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 46th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,941¼ mls.)	£	£	£	£	£	£
Passenger-train traffic...	386,000	371,000	+ 15,000	22,039,000	21,688,000	+ 351,000
Merchandise, &c. ...	474,000	468,000	+ 6,000	20,510,000	19,192,000	+1,318,000
Coal and coke ...	258,000	247,000	+ 11,000	10,340,000	9,905,000	+ 435,000
Goods-train traffic ...	732,000	715,000	+ 17,000	30,850,000	29,097,000	+1,753,000
Total receipts	1,118,000	1,086,000	+ 32,000	52,889,000	50,785,000	+2,104,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	255,000	254,000	+ 1,000	14,269,000	14,033,000	+ 236,000
Merchandise, &c. ...	352,000	351,000	+ 1,000	14,453,000	13,479,000	+ 974,000
Coal and coke ...	248,000	243,000	+ 5,000	10,395,000	9,595,000	+ 800,000
Goods-train traffic ...	600,000	594,000	+ 6,000	24,848,000	23,074,000	+1,774,000
Total receipts	855,000	848,000	+ 7,000	39,117,000	37,107,000	+2,010,000
G.W.R. (3,750¾ mls.)						
Passenger-train traffic...	160,000	160,000	—	9,356,000	9,342,000	+ 14,000
Merchandise, &c. ...	189,000	187,000	+ 2,000	8,266,000	7,772,000	+ 494,000
Coal and coke ...	104,000	106,000	− 2,000	4,532,000	4,455,000	+ 77,000
Goods-train traffic ...	293,000	293,000	—	12,798 000	12,227,000	+ 571,000
Total receipts	453,000	453,000	—	22,154,000	21,569,000	+ 585,000
S.R. (2,176 mls.)						
Passenger-train traffic...	240,000	234,000	+ 6,000	13,510,000	13,299,000	+ 211,000
Merchandise, &c. ...	64,000	65,000	− 1,000	2,930,500	2,817,500	+ 113,000
Coal and coke ...	33,000	34,000	− 1,000	1,408,500	1,333,500	+ 75,000
Goods-train traffic ...	97,000	99,000	− 2,000	4,339,000	4,151,000	+ 188,000
Total receipts	337,000	333,000	+ 4,000	17,849,000	17,450,000	+ 399,000
Liverpool Overhead ... (6½ mls.)	1,074	1,130	− 56	52,411	52,212	+ 199
Mersey (4½ mls.) ...	4,314	4,157	+ 157	186,485	182,866	+ 3,619
*London Passenger Transport Board ...	534,600	516,000	+ 18,600	10,612,300	10,468,700	+ 143,600
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,694	1,665	+ 29	116,379	117,914	− 1,535
" " goods	510	581	− 71	23,860	23,939	− 79
" " total	2,204	2,246	− 42	140,239	141,853	− 1,614
Great Northern pass. (562 mls.)	7,850	6,900	+ 950	459,600	358,700	+ 100,900
" " goods	10,250	10,050	+ 200	393,300	320,250	+ 73,050
" " total	18,100	16,950	+ 1,150	852,900	678,950	+ 173,950
Great Southern pass. (2,158 mls.)	18,982	17,022	+ 1,960	1,106,608	1,090,994	+ 15,614
" " goods	39,068	36,669	+ 2,399	1,511,956	1,432,475	+ 79,481
" " total	58,050	53,691	+ 4,359	2,618,564	2,523,469	+ 95,095

* 20th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

British and Irish Railways Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices Nov. 21, 1934	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	31	51½	+1½
5% Con. Prefce. ...	109¾	69½	117	+1½
5% Red.Pref.(1950)	109¼	87½	110½	—
4% Deb.	108 15/16	99¼	116½	+1½
4½% Deb.... ...	108	100¾	117½	—
4½% Deb.... ...	116	106	126½	+1
5% Deb.	128	117¼	133½	—
2½% Deb.... ...	65	60	72½	—
5% Rt. Charge ...	124	111½	132½	—
5% Cons. Guar. ...	122	103	131½	+1½
L.M.S.R.				
Ord.	29⅞	12⅛	22	+½
4% Prefce. (1923)	51	17	50½	+½
4% Prefce. ...	72	33¼	85½	+½
5% Red. Prf. (1955)	93	47¼	103½	—
4% Deb.	103¼	89½	113	+½
5% Red.Deb.(1952)	114	105	116½	+1
4% Guar.	97¼	68⅜	106	+1
L.N.E.R.				
5% Pref. Ord. ...	22½	7¾	15¾	+¼
Def. Ord.	10¾	4⅛	7¾	+¼
4% First Prefce. ...	65½	19⅜	70	+½
4% Second Prefce.	40½	12¼	32	+1
5% Red.Pref.(1955)	83¾	27	90½	—
4% First Guar. ...	94¾	58¼	103½	+½
4% Second Guar.	89¼	48	97	—
3% Deb.	77	60¼	88½	+½
4% Deb.	102¾	80	113	+1
5% Red.Deb.(1947)	112	102½	116	+1
4½% Sinking Fund Red. Deb.	107½	98¾	108½	—
SOUTHERN				
Pref. Ord.... ...	71	27¾	79	+2
Def. Ord.	24⅜	9⅝	23½	+1
5% Prefce. ...	107 11/16	74	117½	+2
5% Red.Pref.(1964)	107¾	78⅞	113½	—
5% Guar. Prefce.	124¼	102¾	131½	+4½
5% Red.Guar.Pref. (1957)	115⅝	103½	118	+1
4% Deb.	107½	96¾	116	+2
5% Deb.	126½	114¼	132½	+1
4% Red. Deb. 1962–67	107¼	100	112½	—
BELFAST & C.D.				
Ord.	6		5	—
FORTH BRIDGE				
4% Deb.	99½	95½	111½	+4
4% Guar. ...	98½	94	110½	+3
G. NORTHERN (IRELAND)				
Ord.	7½	3½	7	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	16½	−
Prefce.	24	12⅛	16½	—
Guar.	42	16¾	42	−½
Deb.	60	30⅞	61	—
L.P.T.B.				
4½% "A" ...	117⅞	112	125½	—
5% "A"	127¼	119¼	134½	+1
4½% "T.F.A." ...	111¼	106	112½	—
5% "B"	122½	114	130½	+1
"C"	86¾	74½	93	+1
MERSEY				
Ord.	16¼	5	9	—
4% Perp. Deb. ...	83	63⅞	87½	+1
3% Perp. Deb. ...	62	51	66½	+1
3% Perp. Prefce....	50⅝	27	46½	−

CONTRACTS AND TENDERS

D. Wickham & Co. Ltd. has received an order from the L.N.E.R. for 19 permanent way motor gang trolleys and 15 trailers. This firm has also received an order for one gang trolley for the Northern Counties Committee, L.M.S.R.

L.M.S.R. 1935 Rolling-stock Programme

The L.M.S.R. announces that 10,883 new passenger and goods vehicles will be provided under an extensive programme of carriage and wagon building, to be undertaken in 1935. Most of these vehicles will be constructed in the L.M.S.R. workshops at Derby and Wolverton. Additions to the passenger stock will comprise 607 new carriages, including 166 vestibule, 315 corridor, and 14 restaurant cars, together with 100 luggage and parcel vans, 100 covered combination trucks and 26 other coaches. A total of 10,050 freight train vehicles is provided for and orders for 1,950 of these divided between the Metropolitan-Cammell Carriage & Wagon Co. Ltd., Birmingham Railway Carriage & Wagon Co. Ltd., Hurst Nelson & Co. Ltd. and Charles Roberts & Co. Ltd. have already been announced in this column in our issues of August 3 and October 26. Among the largest items in the wagon building programme are 5,000 covered wagons of 12-tons capacity. A large number of the vehicles are for the conveyance of special types of traffic, including 100 20-ton tube wagons, 250 20-ton steel hopper wagons, 20 12-ton tractor trucks, 10 20-ton bulk grain vans, and 100 cattle trucks. A total of 3,290 wagons will be fitted to run on express goods trains to further assist the speeding-up of merchandise traffic.

Polish Railway Electrification Order

British Insulated Cables Limited, of Prescot, Lancashire, has obtained the contract for the overhead equipment and rail bonding of the first portion of the Polish State Railways to be electrified. The work is being carried out on behalf of the contractors' committee for the electrification of State Railways. The lines to be electrified consist of the Warsaw suburban lines, including a complicated system of tracks in Warsaw, with 1½ km. of double track tunnel and double tracks to Zyrardow in the south-west, to Otwock in the south-east, and to Nowa Minsk in the east, a total mileage of 155 miles of single track equivalent. The system will be 3,000 volts d.c. and the design of the overhead equipment will include special features. A double contact wire will be used, each wire being supported from the catenary at alternate droppers. The catenaries for each track are to be supported by independent structures, with special provision for longitudinal movement of catenary and contact wires due to the wide extremes of temperature obtaining in Poland. The bonds are to be of the welded type attached to the rail head. An article describing the Polish State Railways electrification appeared in our *Electric Railway Traction Supplement* on January 12 of this year.

Leyland Motors Limited has received the following orders from railway-associated road transport operators :— W. Alexander & Sons Ltd. : 25 oil-engined Cubs and an oil-engined Titan ; Crosville Motor Services Limited : 40 Lions (of which 25 are oil-engined), six oil-engined Titans, three oil-engined gearless buses, and three Tigers ; Southdown Motor Services Limited : 12 gearless buses ; and L.M.S.R. : one Leyland vehicle.

New Locomotives for Mysore

W. G. Bagnall & Co. Ltd. has received an order from the Government of Mysore for two metre gauge superheated 2-6-2 tank locomotives at a total price of £4,500 f.o.b. Mersey. These engines will have outside cylinders 11½ in. diam. × 18 in. stroke, coupled wheels 3 ft. 7 in. diam., boiler working pressure 180 lb. per sq. in., total weight in working order 35 tons, estimated tractive effort at 85 per cent. boiler pressure 8,475 lb., tank capacity 1,000 galls., and fuel capacity 70 cu. ft. These engines are for light shuttle passenger service and the enquiry for tenders was announced in this column in our issue for June 1.

The General Cable Corporation has received an order from the Government of Mysore for 420 miles of copper wire.

Ransomes & Rapier Limited has received an order from the Government of Mysore for one 56-ft. electrically-operated metre and 2 ft. 6 in. gauge traverser at a total price of £1,648 f.o.b. London.

Davison & Sons has received an order from the Government of Mysore for 12 portable steelyard type 10-ton locomotive wheel balances to take wheels up to 60 in. diam. The value of this contract is £852 f.o.b. Liverpool.

Shaw Wallace & Co. Ltd. has received an order from the North Western Railway of India for 600,000 mild steel dogspikes.

The Leyland & Birmingham Rubber Co. (India) Ltd. has received orders from the Indian Stores Department for 1,200 sets I.R. auxiliary bearing springs, 2,750 I.R. drawbar springs with M.S. dividing plates and 250 I.R. drawgear springs.

Shaw Wallace & Co. Ltd. has received an order from the Indian Stores Department for 100 10 in. × 5 in., 7 ft. 4 in. journal centres, carriage and wagon axles at a total price of Rs. 11,700 and 300 5 ft. 6 in. gauge, 3 ft. 7 in. diam. carriage and wagon axles at a total cost of Rs. 19,088 c.i.f. Karachi.

Pilkington Bros. Limited is to supply glass sheet under running contracts for the North Western, Great Indian Peninsula and East Indian Railways.

L. Weekes (Luton) Limited has received an order from the Junagad State Railway for switch sockets and plugs for Veraval Harbour electrification, to the inspection of the consulting engineers, Messrs. Robt. White & Partners.

The Associated Electrical Industries (India) Limited has received an order from the Indian Stores Department for a B.T-H. motor-driven alternator set complete with switchgear and distribution switchboard at a total cost, including erection, of Rs. 11,850.

Snow & Co. Ltd. has received an order from the South African Government Railways and Harbours Administration for one 10-ton vertical type surface grinder with hydraulic table traverse.

Beyer, Peacock & Co. Ltd. has received an order from the South African Railways and Harbours Administration for eight locomotive steel fireboxes each fitted with two Nicholson thermic syphons. These fireboxes are for Class GL Beyer-Garratt locomotives, which it will be recalled, have a tractive effort of 90,000 lb. and a grate area of 75 sq. ft.

The Egyptian State Railways Administration has recently placed orders as follow :—

Fried Krupp : Helical springs at total cost of £282 10s., delivered f.o.b. Rotterdam-Antwerp. (Ref. No. E.S.R. 21.217.)

J. Ghion : Axleboxes at total cost of £262 10s., delivered f.o.b. Antwerp. (Order No. 21.200 of July 17.)

The Crown Agents for the Colonies have recently placed orders as follow :—

British Ropeway Engineering Co. Ltd. : Aerial ropeway coal transporter.
Turner's Asbestos Cement Company : Asbestos sheets.
W. C. Jones Limited : Coloured cotton waste.
Albion Motors Limited : Compression-ignition engines.
Thos. Bolton & Sons Ltd. : Copper ingots.
T. Smith & Sons (Rodley) Ltd. : Steam travelling cranes.
Cargo Fleet Iron Co. Ltd. : Fishplates.
Norris, Henty & Gardner's Limited : Gardner engines.
Stewarts and Lloyds Limited : Piping.
General Electric Co. Ltd. : Indoor and outdoor substation equipment.
Ford Motor Co. Ltd. : Motor lorries.
Silvertown Lubricants Limited : Lubricating oil.
Torbay Paint Company : Paint.
Ransomes & Rapier Limited ; Petrol-electric mobile crane.
P. & W. MacLellan Limited : Steel.
Alex. Findlay & Co. Ltd. : Steel bridgework.
South Durham Steel & Iron Co. Ltd. : Steel pipes.
Tubes Limited : Steel tubes.
Taylor Bros. & Co. Ltd. and Thos. Firth & J. Brown Limited : Steel tyres.
Standard Switchgear Limited : Sub-station switchboard.
Metropolitan-Vickers Electrical Co. Ltd. : Turbo-generator plant.

The Egyptian State Railways Administration has received the following offers in reply to its invitation for tenders for the supply of 150,000 metric tons of coal :—Societe Egypto-Polonaise, 20s. per ton, c.i.f., and 11s. 9d. f.o.b. ; Deutsche Kohlendepot, 22s. 6d. c.i.f. ; Evans Reid, 23s. 2½d. c.i.f. and 18s. 1½d. f.o.b. ; Beynons, 23s. 11d. c.i.f. and 17s. 7½d. f.o.b. ; Guéret Llewellyn, 24s. 1d. c.i.f. ; Maris Export, 24s. 5d. c.i.f. ; Watts Watts, 25s. 6d. c.i.f. and 18s. 1½d. f.o.b. ; Tabb Burletson, 25s. 6d. c.i.f. and 18s. 2½d. f.o.b. ;

OFFICIAL NOTICES

THE MADRAS & SOUTHERN MAHRATTA RAILWAY CO. LTD. invite Tenders for :—

924 TONS (Approx.) STEEL MATERIAL. (Comprising—M.S. Rounds, Squares, Angles, Flats, &c., approx. 634 tons and M.S. Plates and Sheets 290 Tons approx.)

Specification and Form of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, London, S.W.1. Fee ONE GUINEA, *which will not be returned.*

Tenders must be submitted not later than 2 o'clock p.m. on TUESDAY, 18TH DECEMBER, 1934.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
C. L. MAGNIAC,
Secretary.

Buenos Ayres Western Railway Limited

THE Registers of the Company's 4 per cent. and 5 per cent. Debenture Stocks will be closed from Tuesday, the 27th November, to Monday, the 3rd December, both days inclusive, for the purpose of preparing the half-yearly interest warrants.

By Order of the Board,
ROBERT GRAHAM,
Secretary.

Offices of the Company,
River Plate House,
Finsbury Circus, E.C.2.
16th November, 1934.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

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Milburn's, 25s. 9d. c.i.f. and 18s. 1d. f.o.b.; and Pyman Watson, 25s. 10d. c.i.f. and 18s. 1d. f.o.b.

Steel, Peech & Tozer Limited has received an order for 200 steel locomotive tyres for the Central Argentine Railway.

W. & T. Avery Limited has received an order for one Avery self-indicating Dormant type weighing machine, 1,500 kilos capacity, for the Buenos Ayres Southern Dock Co. Ltd.

The United Steel Cos. Ltd. (Workington Iron and Steel Branch), through J. W. Harker & Co. Ltd., has received an order from the Leopoldina Railway for 1,000 tons of steel rails and 68 tons of fishplates.

The Yorkshire Lubricator Co. Ltd. has received orders for the supply of axlebox dust shields and pads for the whole of the 1,700 wagons which, as stated in this column in our October 26 issue, are under construction for the L.M.S.R. in the shops of the Metropolitan-Cammell Carriage & Wagon Co. Ltd., Birmingham Railway Carriage & Wagon Co. Ltd., Charles Roberts & Co. Ltd., and Hurst Nelson & Co. Ltd.

Final arrangements for covering next year's requirements of rails and steel sleepers have, according to Reuters, been approved by the Board of Directors of the Belgian State Railways Company, and the programme of improvements to equipment has been worked out. This programme is stated to include an order for Belgian works for the supply of passenger locomotives.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), invites tenders, receivable on the dates mentioned, as follow :—

For 8,700 drawbar springs for I.R.C.A. drawgear for the E.I. Railway (December 5).

For one electric motor-driven air compressor set for the wagon repair shop at Ondal, E.I. Railway (December 5).

For the conversion of two existing 120-ton double crab cranes at Lucknow shops into four 60-ton single crab cranes and erection at Jamalpur locomotive shops, E.I. Railway, and including supply of two pairs of 60-ton crane girders (December 18).

Exports of Railway Material from the U.K. in Oct.

	Oct., 1934	Oct., 1933	Ten Months Ending Oct., 1934	Ten Months Ending Oct., 1933
	£	£	£	£
Locomotives, rail	27,678	10,376	236,705	718,876
Carriages and wagons	78,105	46,474	716,872	404,838
Rails, steel	74,570	36,402	891,820	450,631
Wheels, sleepers, fishplates and miscellaneous materials	114,250	78,370	989,315	637,015

Locomotive and rail exports included the following :—

	Locomotives		Rails	
	Oct., 1934	Oct., 1933	Oct., 1934	Oct., 1933
	£	£	£	£
Argentina	—	—	6,851	10,151
Union of South Africa	—	3,012	55,872	17,173
British India	1,040	4,980	31 621	26,751

Forthcoming Events

Nov. 23 (*Fri.*).—Railway Operating Division (R.E.), at Trocadero Restaurant, Shaftesbury Avenue, London, W.1. Re-union Dinner at 7.30 for 8 p.m.

Strattordians' Association, at Abercorn Rooms, Great Eastern Hotel, Liverpool Street, London, E.C.2. Re-union Dinner.

Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 7 p.m. "The Overseas Engineering Representative, his Problems and Difficulties," by Mr. B. W. Bagshawe.

Nov. 26 (*Mon.*).—G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. "Road and Rail Traffic Act, 1933," by Mr. D. Hawkeswood.

Railway Students' Association (Edinburgh), at Goold Hall, St. Andrew Square, 8 p.m. "Operating and Handling of Goods Traffic," by Mr. R. Tweeddale.

Nov. 27 (*Tues.*).—L.N.E.R. (Middlesbrough) Lecture and Debating Society, at Cleveland Scientific and Technical Inst., Corporation Road, 7.15 p.m. "A Works Railway," by Mr. J. H. Baker.

Institute of Transport (Birmingham Graduate), at Imperial Hotel, 6.30 p.m. "The Railway and its Signals," by Mr. P. J. Chilcott.

Nov. 28 (*Wed.*).—L.N.E.R. (Newcastle and Sunderland) Lecture and Debating Society, at Sunderland, 7 p.m. "The Advantages of the New Block Regulations," by Mr. F. Moiser.

Permanent Way Institution, Leeds, at Quebec House, Quebec Street, 7.30 p.m. "Some Debatable Permanent Way Matters," by Mr. W. A. Willox.

Nov. 29 (*Thurs.*).—G.W.R. (London) Lecture and Debating Society, in General Meeting Room, Paddington Station, 5.45 p.m. "Getting and Holding Traffic," by Mr. F. W. Lampitt.

Institution of Locomotive Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. "Ejectors," by Mr. C. Arnold.

Nov. 30 (*Fri.*).—L.N.E.R. Musical Society, at Hamilton Hall, London, E.C.2, 8 p.m. Bohemian Concert.

Dec. 4 (*Tues.*).—Industrial Transport Association, at British Iron and Steel Federation, Caxton House (East), Tothill Street London, S.W.1, 6.30 p.m. "Deferred Rebates," by Mr. C. E. Jordan.

Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Rationalisation in the Goods Department," by Mr. L. S. Sherwood.

L.N.E.R. (Middlesbrough) Lecture and Debating Society, at Cleveland Scientific and Technical Inst., Corporation Road, 7.15 p.m. "Chemistry as Allied to a Railway Company," by Mr. H. A. Houston.

Retired Railway Officers' Society, in Room 300, Great Eastern Hotel, Liverpool Street, London, E.C.2, 2.30 p.m. Ordinary Meeting.

Dec. 5 (*Wed.*).—Institute of Metals (London), at Society of Motor Manufacturers, 83, Pall Mall, S.W.1, 7.30 p.m. "Manganese Bronze," by Mr. W. Lambert.

Dec. 6 (*Thurs.*).—L.N.E.R. (York) Lecture and Debating Society, at Railway Inst., Queen Street, 7 p.m. "The Development of Road Motor Services in the North-Eastern Area," by Mr. A. A. Harrison.

Railway Students' Association, at London School of Economics, Houghton Street, W.C.2. "The Future of Railways," by Mr. E. J. H. Lemon, O.B.E.

Railway Share Market

In the stock and share markets the pace of the rise in gilt-edged stocks has not been so fast as earlier in the month, but brokerage firms continue to report a good demand for home railway prior charge stocks which now are only on offer in relatively small lines. It is not many months ago since the amounts on offer were substantial. Insurance companies and trust investment companies have been fairly large buyers, the yields of 3⅜ to 3½ per cent. on such stocks as the 4 per cent. debentures of the Great Western, Southern and the London Midland & Scottish being regarded as a useful "sweetener" in a portfolio of British Government stocks, which now only give an average yield of 3 per cent.

It is hardly realised yet by the plain investor that 3 per cent. Conversion loan and many municipal stocks do not now give a yield of more than £2 17s. per cent. When the question of reinvestment arises more extensively at the end of the current year the demand for the higher-yielding Home railway stocks is likely to carry them up still further in capital value. In the Stock Exchange there is considered to be no sound reason for selling London Transport Board "A" stock on the basis of a £3 12s. per cent. yield, Great Western 4 per cent. debenture stock on a 3⅜ per cent. basis or Southern 4 per cent. debentures on the basis of a yield of £3 11s. 9d. per cent., whilst the investor has to pay for Blackpool 3 per cent. stock a premium which reduces the yield to £2 19s. 3d. per cent.

The difference between the credit of Blackpool municipality and the London Passenger Transport Board, Great Western or the Southern Railways is not so much in favour of Blackpool as to justify this big disparity in yield, notwithstanding all the difficulties under which the railway companies are labouring. One of the features of recent business has been the demand for the "C" stock of the London Passenger Transport Board, which has risen this week to 93½ as compared with 81 two months ago. According to current market calculations, this stock is now earning a little less than 4 per cent., with the traffic trend continuing upward.

In foreign railways Argentine ordinary stocks have benefited from the statements made at recent meetings. Buenos Ayres Great Southern ordinary and B.A. Western ordinary stock have been purchased on the estimate that the companies are earning a small dividend on these stocks at the present time. All Argentine preference and debenture stocks have been a better market.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1933-34	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1933	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1933	Prices: Lowest 1933	Prices: Nov. 21, 1934	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	18.11.34	20 520	+ 8 440	46	677,240	494.680	+ 182.560	Ord. Stk.	26	11 5/8	23	Nil
	Argentine North Eastern	753	17.11.34	7,589	— 1,440	20	152.753	191,171	— 38,418	,,	14 1/2	5	9	Nil
	Argentine Transandine	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	8
	Bolivar	170	Oct., 1934	5,600	+ 750	43	59 950	62.050	— 2,100	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	13	3 13/16
	Buenos Ayres & Pacific	2,806	17.11.34	71.613	— 10 473	20	1,367.851	1,644 762	— 276 911	Ord. Stk.	26	9 7/16	10 1/2	Nil
	Buenos Ayre Central	190	28.10.34	$118 900	+ $13 800	17	$2,205.400	$2,055 200	+ $150 209	Mt. Db.	30	10	23	Nil
	Buenos Ayre Gt. Southern	5,085	17.11.34	123.284	— 41 764	20	2,412,802	3,068 119	— 655 317	Ord. Stk.	44 1/2	21 1/2	26	Nil
	Buenos Ayres Western	1,930	17.11.34	44 575	— 15 616	20	814.754	1,062.193	— 247.439	,,	34 1/2	15 3/4	23	Nil
	Central Argentine	3,700	17.11.34	103 419	— 53,380	20	2,360,231	2,713,707	— 353,476	,,	28 1/2	15	16	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	18	10	9	Nil
	Cent. Uruguay of M. Video	273	17.11.34	19 630	— 1,316	20	309 687	314.024	— 4,337	Ord. Stk.	20	8	10 1/2	Nil
	Do. Eastern Extn.	311	17.11.34	3 787	— 468	20	62 040	58 460	+ 3 580	—	—	—	—	—
	Do. Northern Extn.	185	17.11.34	2 056	— 223	20	34 602	33 789	+ 813	—	—	—	—	—
	Do. Western Extn.	211	17.11.34	2 013	+ 319	20	28.761	28 476	+ 285	—	—	—	—	—
	Cordoba Central	1,218	17.11.34	27 570	— 9.850	20	609.080	812 930	— 203 85	Ord. Inc.	9 1/4	2 1/2	4 1/2	Nil
	Costa Rica	188	Sept., 1934	16 684	— 1.648	9	49 839	64 775	— 14 936	Stk.	29	20	30	6 11/16
	Dorada	70	Oct., 1934	11.700	+ 3,500	43	102 400	78 400	+ 24 000	1 Mt. Db.	76 1/2	68 3/4	102 1/2	5 7/8
	Entre Rios	810	17.11.34	13 032	— 1,012	20	227 491	262.343	— 34.852	Ord. Stk.	26 1/2	9	13	Nil
	Great Western of Brazil	1,082	17.11.34	14 900	+ 200	46	393,700	456 300	— 62.600	Ord. Sh.	23/6	1/2	5/8	Nil
	International of Cl. Amer.	794	Sept., 1934	$279 814	+ $65.830	39	$3,639.905	$3,499.968	+ $139.937	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/2	1/16	1/2	Nil
	La Guaira & Caracas	22 3/4	Oct., 1934	3 200	— 50	43	36 065	49 770	— 13.705	Stk.	16	10	8 1/2	Nil
	Leopoldina	1,918	17.11.34	22 583	— 1,728	46	1,178 020	1,137 258	+ 40 762	Ord. Stk.	20 1/4	10	9	Nil
	Mexican	483	14.11.34	$257.600	+ $62 700	19	$4.361 400	$3,631,100	+ $730.300	,,	3	1/2	2	Nil
	Midland of Uruguay	319	Oct., 1934	12,938	+ 3 321	17	38 789	34 516	+ 4,273	,,	2	1	1 1/2	Nil
	Nitrate	401	15.11.34	14.719	+ 9,394	45	219 705	117 975	+ 101.730	Ord. Sh.	78/6	11/16	2/6	Nil
	Paraguay Central	274	17.11.34	4 630	+ 1,940	20	90 180	67.160	+ 23 020	Pr. Li. Stk.	72	49 1/2	72	8 5/7
	Peruvian Corporation	1,059	Oct., 1934	64 407	+ 10 107	17	250 845	216 868	+ 33 977	Pref.	15 1/4	5	9 3/4	Nil
	Salvador	100	10.11.34	₡9 954	— ₡6 596	19	₡180.946	₡261.715	— ₡80 769	Pr. Li. Db.	70	66 1/2	70	7 1/9
	San Paulo	1531/2	11.11.34	27 267	— 2,605	45	1,337.843	1,357.622	— 19.779	Ord. Stk.	102	68	74 1/2	5 3/8
	Taltal	164	Oct., 1934	2 300	+ 605	17	9.205	7 088	+ 2 117	Ord. Sh.	15/4	5/4	17/8	5 5/16
	United of Havana	1,365	17.11.34	15,472	+ 2,737	20	330 970	252 067	+ 78,903	Ord. Stk.	8	2	3	Nil
	Uruguay Northern	73	Oct., 1934	1,132	— 70	17	4,444	4,431	+ 13	Deb. Stk.	6	3 1/2	5 1/2	Nil
Canada.	Canadian National	23,736	14.11.34	620,561	+ 14.938	45	28.812.773	25.814.666	+2,998.107	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—4p.c.	Perp. Dbs.	60 1/2	38	77	5 5/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99 3/4	85	104§	3 7/8
	Canadian Pacific	17,018	14.11.34	507.200	+ 51,000	45	21.777 800	19.732 800	+2.045 000	Ord. Stk.	22 1/8	11	12	Nil
India.†	Assam Bengal	1,329	20.10.34	23 640	— 2,380	29	777.859	659 362	+ 118 497	Ord. Stk.	79	70	87 1/2	3 7/16
	Barsi Light	202	27.10.34	1,762‡	— 2,483	30	81 982	85.852	— 3,870	Ord. Sh.	10 3/4	70	102 2	5 7/8
	Bengal & North Western	2,112	27.10.34	43,478	+ 2.991	4	154 988	157 955	— 2 967	Ord. Stk.	292	240	291 1/2	5 1/2
	Bengal Doars & Extension	161	27.10.34	3.822	— 258	30	87.961	85 571	+ 2.390	,,	127	119	125 1/2	5 9/16
	Bengal-Nagpur	3,269	20.10.34	97.650	+ 5,621	29	3.172.167	2.917 290	+ 254.877	,,	97 1/4	83 1/2	104 1/2	3 13/16
	Bombay, Baroda & Cl. India	3,072	10.11.34	130,350	— 22.275	32	4 736 850	4 522.800	+ 214 050	,,	112	107	113 1/2	5 5/16
	Madras & South'n Mahratta	3,230	20.10.34	91.350	+ 13,850	29	3,247 638	3,166.934	+ 80,704	,,	127	114 1/4	125 1/2	7 9/16
	Rohilkund & Kumaon	546	27.10.34	7.600	+ 610	4	29.357	27 402	+ 1,955	,,	260	225	258 1/2	5 13/16
	South India	2,526	20.10.34	74,292	+ 4,303	29	2,378,076	2,286,052	+ 92,024	,,	119 1/2	112	117 1/2	6 13/16
Various.	Beira-Umtali	204	Sept., 1934	63 487	+ 15 845	52	651,264	502.517	+ 148 747	—	—	—	—	—
	Bilbao River & Cantabrian	15	Oct., 1934	524*	— 1,064	43	16.719	15.408	+ 1.311	—	—	—	—	—
	Egyptian Delta	621	31.10.34	9 847	— 469	30	130,946	119.375	+ 11 571	Prf. Sh.	13 1/32	15/4	2 3/4	36/9
	Great Southern of Spain	104	10.11.34	2.027	— 993	45	100.658	99,815	+ 843	Inc. Deb.	4	3	3 1/2	Nil
	Kenya & Uganda	1,625	Mar., 1934	240.520	+ 21,064	12	638,137	606,192	+ 31,945	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33 1/2	46 1/2	7 1/2
	Mashonaland	913	Sept., 1934	114.596	+ 26 892	52	1,191,218	819.297	+ 371.921	1 Mg Db.	91 3/4	42	96	5 5/16
	Midland of W. Australia	277	Sept., 1934	13,638	+ 1,333	9	39 590	38.162	+ 1.428	Inc. Deb.	89	70	97 1/2	4 1/9
	Nigerian	1,905	29.9.34	29,877	+ 12.397	26	676 321	575.498	+ 100 823	—	—	—	—	—
	Rhodesia	1,538	Sept., 1934	183,340	+ 18.488	52	1,993 827	1,505,845	+ 487 982	4 p.c. Db.	98 1/2	80 5/4	104	3 13/16
	South African	13.217	27.10.34	532.538	+ 49.274	30	15,112 292	13 321.298	+1,790 994	—	—	—	—	—
	Victorian	6,172	Aug., 1934	740,142	+ 27,143	8	1,433,140	1,380,045	+ 53 095	—	—	—	—	—
	Zafra & Huelva	112	Sept., 1934	14,557	+ 393	39	102,956	99,579	+ 2,987	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

* Rebellion. † Receipts are calculated @ 1s. 6d. to the rupee. ‡ Kartiki Fair, 1933. § ex dividend. Salvador receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.